Dan Raviv Associates, Inc.

Consultants in hydrogeology, environmental sciences and engineering, site investigation/remediation, ISRA and UST compliance

Dan D. Raviv, Ph.D.
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Christopher F. Zwingle, P.E.

DUPLICATE

CASE NO. NJDE981876642

REMEDIAL ACTION SELECTION REPORT
ARSENIC AREA

FORMER CELOTEX INDUSTRIAL PARK
EDGEWATER, NEW JERSEY

DRAI JOB NO. 01C2084

prepared for:

Edgewater Enterprises LLC
55 River Road
Edgewater, New Jersey

Attention: Mr. Scott Heller

prepared by:

Dan Raviv Associates, Inc.
57 East Willow Street
Millburn, New Jersey 07041

May 1, 2002

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New Jersey Department of Environmental Protection
Division of Responsible Party Site Remediation
Bureau of Case Management
401 East State Street
P.O. Box 028
Trenton, New Jersey 08625-0028

Attn: Mr. Robert Hayton, Case Manager

Re: *Remedial Action Selection Report – Arsenic Area*
Former Celotex Industrial Park
Edgewater, New Jersey
Case No. NJDE981876642
DRAI Job No. 01C2084

Dear Mr. Hayton:

On behalf of Edgewater Enterprises, LLC, Dan Raviv Associates, Inc. (DRAI) has prepared the attached *Remedial Action Selection Report* for the Arsenic Area at the above-referenced site.

If you have any questions or need additional information, please call.

Very truly yours,

DAN RAVIV ASSOCIATES, INC.

Linda Caramichael

Linda Caramichael
Project Engineer

Daniel Nachman
Senior Project Manager

R\RASR

c: Mr. Bradley Campbell, Commissioner (NJDEP)
Mr. Richard Ho (USEPA) (3 copies)
Mr. Scott Heller (Edgewater Enterprises)
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REMEDIAL ACTION SELECTION REPORT
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FORMER CELOTEX INDUSTRIAL PARK
EDGEWATER, NEW JERSEY

1.0 INTRODUCTION

Dan Raviv Associates, Inc. (DRAI) has prepared this *Remedial Action Selection Report* (RASR) on behalf of Edgewater Enterprises, LLC to select and describe the most appropriate remedial action for the Arsenic Area at the Former Celotex Industrial Park property (site) in Edgewater, New Jersey (Figure 1). This RASR was prepared in accordance with the *Technical Requirements for Site Remediation* (TRSR), N.J.A.C. 7:26E, *et seq.* and the New Jersey Department of Environmental Protection (NJDEP) *Guidance Document for the Remediation of Contaminated Soils* (NJDEP 1998).

Edgewater Enterprises is conducting a Remedial Investigation (RI) of the Arsenic Area at the site, as described in the NJDEP-approved March 28, 2002 Remedial Investigation Workplan (RIW). The Arsenic Area is shown on Figure 2. The results of the RI completed through April 10, 2002 are summarized in the *Soil Remedial Investigation Report – Arsenic Area* (Dan Raviv Associates, Inc., 2002). The April 12, 2002 RIR, along with a RIR to be prepared upon completion of the delineation, will comprise the complete RIR for the Arsenic Area. Data received from April 10 through April 26, 2002 were used to update the April 12 report; the updated information is provided in this RASR.

Edgewater Enterprises has discussed conceptual remedial strategies for the Arsenic Area that are the subject of this RASR in conversations, written communications and meetings with the NJDEP. The remedial actions presented in this RASR are based on concepts discussed at these meetings, and are consistent with those discussions. While the delineation efforts in the Arsenic Area are ongoing at the current time, sufficient characterization has been completed to provide a basis for the identification and evaluation of remedial alternatives presented in this RASR.

This RASR is organized as follows:

- Sections 1.0 and 2.0 include general background information regarding the former Celotex Industrial Park in Edgewater, New Jersey.

- Section 3.0 discusses the site-specific remedial action selection criteria.

- Section 4.0 describes the remedial actions selected and evaluated for the Arsenic Area. The following information is provided:

  - Detailed description of evaluated and selected remedial actions.

  - Discussions of how the selected remedial action satisfies the remedial action selection criteria.

- Section 5.0 presents a summary and additional information related to permits and construction feasibility that is needed to complete a detailed design.

2.0 PHYSICAL SETTING

2.1 Site Description

The site is located in what was historically an industrial area of Edgewater, New Jersey, along the Hudson River. The Arsenic Area, as defined by the area where arsenic concentrations in excess of 1,000 parts per million (ppm) have been identified, is currently estimated to encompass approximately 1.2 acres, located in the southwestern portion of the site, adjacent to River Road (Figure 2).

2.2 Geology

The information collected from the soil borings drilled as part of this RIW was evaluated to refine the understanding of subsurface conditions. Geologic cross sections are presented on Figures 3, 4, 5, and 6. Approximately 2 to 13 feet of fill material occurs under most of the property. Under most of the facility, there are two distinct layers of fill, an upper fill and lower fill. The upper fill material is generally a dark brown sand and silt, with rocks and construction and demolition debris-type material such as wood, brick and cement fragments. The upper fill is non-indigenous material that was deposited during approximately 1988 to raise the topographic elevation of the site and is not connected to the former site industrial operations, which ceased in the early 1980s. In the on-site portion of the Arsenic Area, the thickness of the upper fill material ranges between approximately 5 and 6 feet.

Approximately 3 to 10 feet of a distinct and older layer of fill material underlies the upper fill material. The lower fill material generally consists of reddish-purple sand; gray clay with cobbles, brick and cement; black sand and silt with cobbles and gravel; wood and concrete. It is believed that the lower fill material was deposited during the initial development of the site, in the late 1800s and/or earlier 1900s. The lower fill material extends off-site, as opposed to the upper fill material, which appears to be limited to the site.

Both the upper and lower fill material meet the definition of Historic Fill material in the TRSR, Section 1.8.

Native soils, consisting of a meadow mat layer, gray silt, and sand layers, are found beneath the lower fill material (Figures 3 through 6). The native soil layer is approximately 3 feet thick in the eastern portion of the Arsenic Area and approximately 20 feet thick in the western portion of the Arsenic Area. The native soils extend to bedrock, which regionally slopes from west to east but has an irregular configuration in the area below and surrounding the Arsenic Area. Bedrock is encountered at approximately 15 to 40 feet below grade (ft bg) in the vicinity of the Arsenic Area. A bedrock surface contour map is shown on Figure 7. The Arsenic Area appears to be located over an area of the site where the bedrock occurs relatively close to land surface.

2.3 Hydrogeology

Based on data obtained from on-site monitoring wells, the water table is generally found at approximately 9 ft bg in the Arsenic Area, which is equivalent to 3 to 4 feet above mean sea level. Ground water flow direction is easterly, with localized fluctuations.

Wells MW2, MW3, MW4 and MW6, located within and downgradient of the Arsenic Area (Figure 2), were sampled for PP+40 analysis in 1997 and for volatile organic compounds (VOCs) and arsenic in 1999. The only contaminants detected above the NJDEP's

Ground Water Quality Standards (GWQS) in the ground water samples collected from the wells within and downgradient of the Arsenic Area were benzene and arsenic. Arsenic concentrations have been high within the Arsenic Area; however, the concentrations reduce to levels below or only slightly above the GWQS over a short distance downgradient of the Arsenic Area.

No ground water quality data were collected as part of DRAI's 2002 delineation efforts. In 2001, DRAI examined the available ground water quality data generated by Enviro-Sciences, Inc. and Environmental Waste Management Associates (EWMA), and reviewed the state of knowledge in the literature regarding the behavior of arsenic in soil and ground water. A discussion of the results of that evaluation was provided to the NJDEP in a workplan submitted by DRAI in June 2001 entitled *Phase II Remedial Investigation Workplan Addendum for the Arsenic Area*. Our review indicated that the arsenic-bearing soils in the southeast corner of the site are not acting as a continuing source of dissolved ground water contamination. Our review of the data indicates the following:

(1) The arsenic present in the fill material occurring in the southwest corner of the site is bound to the soil, is oxidized to the less soluble and mobile form of arsenic (As[V]), and is not partitioning to the dissolved phase in any appreciable concentration.

(2) A large portion of the previously collected ground water arsenic data were not collected using low-flow sampling techniques, and the samples collected were therefore turbid. Arsenic has an affinity for fine-grained particles; the acidification of the samples for preservation will digest arsenic bound in the soil and provide arsenic concentrations that reflect the arsenic content of the introduced sediment, not the arsenic truly dissolved in ground water. Several wells, when sampled by appropriate low-flow techniques, showed arsenic concentrations at least an order of magnitude lower than during previous sampling events. Most of the early high arsenic in ground water data should be discarded because they represent sampling artifacts and are not reliable scientific data that accurately characterize ground water quality.

(3) Whatever arsenic is partitioning to the dissolved phase from the high-arsenic soils is rapidly partitioning back to the sorbed phase as it migrates with ground water flow from the Arsenic Area. This is evidenced at the site by the numerous monitoring wells that are downgradient of the southwest corner that have consistently shown low dissolved arsenic concentrations (below or slightly above the GWQS), and by the expected behavior of arsenic under the conditions at the site. The detection of relatively high arsenic concentrations in monitoring well MW-12 in the northeast portion of the site is either due to an isolated hot spot or a turbidity-induced sampling artifact. The relatively high arsenic concentrations detected in well MW-12 are not caused by a continuous plume emanating from the southwest corner of the Site.

Based on the 1999 and 2001 data, there is a band of monitoring wells downgradient of the Arsenic Area (from south to north, wells MW-7, MW-2, MW-19, MW-3, MW-10, MW-36, MW-35 and MW-34) that have shown very low arsenic concentrations in ground water (ND to 54 ppb). In most cases, these wells showed low arsenic concentrations prior to 1999 as well. The significant decrease in arsenic concentrations over the relatively short distance (300 to 500 ft) between the Arsenic Area and downgradient wells indicates that the high arsenic soils are not generating a high concentration, mobile plume of dissolved arsenic in ground water. This is

consistent with the scientific literature that states that because arsenic compounds are strongly sorbed onto soils, the dissolved phase of these compounds only migrate a short distance before they are re-sorbed to soil particles.

2.4 Summary of Environmental Conditions

The results of the RI conducted to date in the Arsenic Area are summarized on Figure 2. A complete RI report will be provided to the NJDEP once all the data are received.

The RI has demonstrated that the contaminants of concern in the upper fill material are arsenic, lead and PAHs. Copper, mercury, selenium and thallium have been sporadically detected in the upper fill material and are considered to be secondary contaminants of concern.

The primary contaminants of concern in the lower fill material are arsenic, lead and PAHs. Antimony, copper, mercury, selenium, thallium and benzene are the secondary contaminants of concern.

Discoloration of soils was noted in boring SB25, and a test pit was dug to further evaluate the nature of the discoloration. A letter report is being submitted as a companion document to this RASR describing the results of that evaluation. The discoloration is characterized by low levels of total petroleum hydrocarbons and PAHs. No sheen or product was observed after allowing a shaken sample of soil and water to separate in a jar. There is no evidence therefore of free or residual product. The accompanying letter report recommends that no further action is required for this discoloration.

Observations of the presence of floating product were noted by EWMA in test pits C3-1, C3-2 and C3-4, adjacent to River Road (Figure 2). EWMA reports that this product floated and had the appearance of waste oil. This product is associated with a known former waste oil storage area on the neighboring Quanta site, located immediately south of the former Celotex site (Figure 2).

The PAHs detected in both the upper and lower fill were detected at concentrations within the range of concentrations reported for Historic Fill in New Jersey, as presented in N.J.A.C. 7:26E-4.6(b)6, with the exception of naphthalene. Naphthalene is not listed as a Historic Fill constituent. Naphthalene was detected above the soil quality criteria in only two samples in the center of the Arsenic Area. Edgewater Enterprises has agreed to engineering and institutional controls for the Historic Fill under the entire site. For the purposes of this RASR, arsenic and lead are the only contaminants of concern.

3.0 REMEDIAL ACTION SELECTION CRITERIA

Remedial actions that will reduce or eliminate exposure to contaminants in the media of concern that are above the applicable remediation standards have been selected for the Arsenic Area. This section presents the criteria that were used as the basis of remedial action selection.

The remedial action selection criteria were developed based on the requirements of the TRSR, N.J.A.C. 7:26E-5.1, as follows:

1. As per N.J.A.C. 7:26E-5.1(b) 1 and 2, establish remedial action objectives/goals (identify media of concern and applicable remediation standards). Remedial action objectives/goals are presented in Section 3.1, below.

2. As per N.J.A.C. 7:26E-5.1(b) 3 and 4, establish the remediation approach (active treatment versus containment and exposure controls; and for soil, select among unrestricted use, limited restricted use or restricted use remedial action). Remediation approaches are discussed in Section 3.2, below.

3. As per N.J.A.C. 7:26E-5.1(c) 1 through 5, use specific remediation selection factors to establish the remedial actions which will reduce or eliminate exposure to contaminants above the applicable remediation standard. These additional, specific remedial action selection factors are discussed in Section 3.3, below.

3.1 Remedial Action Objectives/Goals

As per N.J.A.C. 7:26E-5.1(b) 1 and 2, remedial action objectives/goals were established by identifying the media of concern and selecting applicable remediation standards, as described in the following sections.

3.1.1 Media of Concern

The media of concern for this RASR are soil and ground water; the contaminants of concern (COCs) are arsenic and lead. Refer to Section 2.0 for a more detailed discussion on the selection of these media and contaminants of concern.

3.1.2 Applicable Remediation Standards

This section discusses the applicable remediation standards, selected based on current and future land use, with which the proposed remedial action will comply.

As discussed in Section 2.0, the fill under the site, which extends from land surface to the top of the native soils, has been characterized to be Historic Fill as defined in the TRSR N.J.A.C. 7:26E-1.8. Historic Fill materials in New Jersey have been found to contain arsenic and lead concentrations significantly above the NJDEP soil quality criteria. Maximum concentrations of Historic Fill concentrations are provided in Table 4.2, presented in N.J.A.C. 7:26E-4.6(b)6. In this table, the maximum concentration for arsenic is 1,098 ppm, and for lead is 10,700 ppm.

In addition to the ongoing delineation efforts for the Arsenic Area, soil quality data have been generated during several other investigative programs at the Site. Outside the Arsenic Area, arsenic has been detected throughout the site at concentrations ranging from less than 20 ppm to several hundred ppm, and in a few instances, slightly over 1,000 ppm.

Detections between 100 and 1,000 ppm occur sporadically throughout the Site, such that even the delineation of arsenic concentrations over 100 ppm becomes problematic.

The range and sporadic distribution of arsenic concentrations throughout the site are indicative of typical historic fill materials in New Jersey, and therefore, remedies applicable to Historic Fill under the TRSR should be applicable to portions of the site with arsenic concentrations below 1,000 ppm. In this regard, it is important to note that the exceedances of NJDEP soil quality criteria that occur sporadically throughout the site have been addressed in the site development plans, which will include proposals for engineering and institutional controls, in the form of asphalt and concrete caps over all surfaces and a Deed Notice.

Edgewater Enterprises proposes that the applicable remediation standard for the Arsenic Area therefore be 1,000 ppm for arsenic; i.e., this RASR should address remedial alternatives for soils with arsenic concentrations in excess of the Historic Fill maximum, as listed in N.J.A.C. 7:26E-4.6(b)6. Edgewater Enterprises proposes that the applicable remediation standard for lead, for the purposes of this RASR, be 10,000 ppm, since the Historic Fill maximum is listed as 10,700 ppm.

3.2 Remediation Approach

As per N.J.A.C. 7:26E-5.1(b) 2 and 3, the remediation approach for each medium of concern in the Arsenic Area was selected between active treatment versus containment and exposure controls. Also, the remediation approach for soils was selected among unrestricted use, limited restricted use or restricted use.

3.2.1 Soil and Ground Water

Containment and exposure control is the selected remediation approach for Arsenic Area soils and ground water. Other remediation approaches that were evaluated included: combination of containment/exposure controls and active treatment; and active treatment. A more detailed discussion of the evaluation of each of these remediation approaches is included in Section 4.0.

Containment and exposure control remedies evaluated for soil include a variety of engineered systems that are implemented for the purpose of encapsulation or covering of contaminated soils that will be left untreated within an area of concern or site. Such engineered systems include cap systems and barrier walls. The primary purposes of such systems are to eliminate direct contact exposure with contaminated soils and to eliminate migration of contaminants from the soil to ground water, air or other clean soil areas.

Containment and exposure control remedies evaluated for ground water include cap systems, barrier walls and a Classification Exception Area (CEA).

Institutional Controls (Deed Notice for soils and CEA for ground water) will be established as part of the implementation of the containment and exposure control remedy. Therefore, the remediation approach for Arsenic Area soils is considered to be a limited restricted-use remedial action, which is essentially a remedy that involves the use of engineering and/or institutional controls.

Selection of a limited restricted-use remedial action (i.e., one with engineering and institutional controls) is consistent with the selection of restricted-use soil remediation

standards (refer to Section 3.1.2 Applicable Remediation Standards), and is justified based on satisfying the following criteria listed in the TRSR, N.J.A.C. 7:26E-5.1(e).

1. The selected remedial approach (containment and exposure controls for soil and ground water, limited restricted-use for soils) will be protective of human health and the environment, and will remain so long as contamination exists above a concentration that would allow for the unrestricted use of the property.

2. Access and/or exposure to the Arsenic Area will be properly controlled. Current and future use of the site is consistent with a limited restricted use remedial action. Engineering and institutional controls are appropriate for the site-specific degree of risk.

3. The owner of the contaminated property will agree, in writing (e.g., with an acceptance signature on the Deed Notice), to the implementation of the limited restricted use remedial action, including monitoring, until such time that the Department approves in writing the removal of the control.

4. The potential for off-site migration of contamination through erosion, subsurface migration or other migration pathways will be mitigated or eliminated.

3.2.2 Free Product

Consistent with the TRSR [N.J.A.C. 7:26E-6.1(d)] and the NJDEP's January 1998 *Guidance Document for the Remediation of Contaminated Soils*, free and residual product, if present and if determined to originate on-site, will be treated or removed, wherever practicable, prior to the implementation of soil and ground water remedial actions that rely on engineering and/or institutional controls. Free product that is associated with the adjacent Quanta site, which is currently under the jurisdiction of the U.S. Environmental Protection Agency (USEPA), will be addressed in the future as part of the USEPA's remedy selection process for the Quanta site (see Section 3.4).

3.3 Remedial Action Selection Factors

As per N.J.A.C. 7:26E-5.1(c) 1 through 5, remedial actions for the Arsenic Area were selected based on the following five factors, listed below.

1. Ability to protect the public health and safety and the environment, based on:

   a. Technical performance, effectiveness and reliability of the remedial action in attaining and maintaining compliance with the applicable remediation standards.

   b. Reduction of toxicity, mobility, or volume of contamination.

   c. Minimization of risks and short-term impacts associated with either implementation or with any contamination left on-site, while still providing long-term protection.

   d. The degree to which the potential for off-site migration is mitigated or eliminated.

2. Implementability, based on:

   a. Engineering and scientific feasibility.

   b. Ability to implement within a reasonable timeframe.

   c. Property owner's written agreement to the implementation of the restricted use remedial action.

3. Consistency with applicable Federal, State and local laws and regulations, as well as court judgments.

4. Potential impacts on the local community.

5. Potential to cause adverse environmental conditions.

3.4 Adjacent Quanta Site

The Quanta site, immediately south of the Celotex site, is currently being evaluated by the USEPA for inclusion on the Federal Superfund list. To date, several contaminants and contaminated media have been identified on the Quanta site, including floating and sinking products, and arsenic in soil. The USEPA currently plans to conduct a RI/FS for the Quanta site and select a remedy for the various contaminated media.

One factor that has to be evaluated in the remedial selection process for the Arsenic Area is the compatibility of the selected remedy with the remedy ultimately selected by the USEPA for the Quanta site. The remedy selected should be sufficiently flexible so as not to preclude the implementation of the remedy ultimately selected by the USEPA for the adjacent Quanta site.

4.0 EVALUATION OF REMEDIAL ALTERNATIVES

4.1 Soil and Ground Water

The four remedial alternatives outlined below were evaluated for soils and ground water in the Arsenic Area at the Former Celotex Industrial Park. All alternatives include hot-spot removal of soil beneath the footprint of Building 400 (see Figure 8).

Remedial Alternative No.	Remediation Approach	Remedial Action
1	Containment and Exposure Control	Soil: Cap and Deed Notice GW: Classification Exception Area (CEA)
2	Containment and Exposure Control	Soil: Cap and Deed Notice GW: Slurry wall with pump and treat, CEA for ground water outside of slurry wall
3	Combination of Containment and Exposure Control and Active Treatment	Soil: Excavation of shallow soils (to the water table) and Deed Notice GW: Slurry wall with pump and treat, CEA for ground water outside of slurry wall
4	Active Treatment	Soil: Excavation of soils to bedrock GW: CEA for ground water outside of excavation area

Each remedial alternative is evaluated separately, below.

4.1.1 Remedial Alternative No. 1

Remedial Alternative No. 1 is the selected remedial action for the Arsenic Area. It is a limited restricted use remedial action (capping with a Deed Notice for soil, and a CEA for ground water) that is consistent with the containment and exposure control remediation approach presented in Section 3.0. In this remedial alternative, a single barrier (e.g., asphalt/concrete) cap would completely cover the area with soil concentrations greater than the applicable remediation standards (see Figure 8); ground water would be monitored to verify that arsenic concentrations above the GWQS do not migrate further. Institutional controls (e.g., Deed Notice and CEA) would be established for both soil and ground water. A supplemental ground water RI would be conducted to verify the current understanding of the interaction between the arsenic-impacted soil in the Arsenic Area and site ground water quality, and to select optimal monitoring locations for the CEA.

When implemented, the remedial action will reduce or eliminate exposures to contaminants in soil and ground water above the applicable remediation standard, and will comply with all of the NJDEP remedial action selection criteria in N.J.A.C. 7:26E-5.1(c) 1 through 5, as outlined below.

(1) Ability to protect the public health and safety and the environment:

A cap system is a proven, effective and reliable containment and exposure control technology according to NJDEP's January 1998 *Guidance Document for the Remediation of Contaminated Soils*. The cap will provide a physical separation between the contaminants and humans, animals, and plant roots. The containment provided by the cap will reduce the mobility of impacted soil and ground water.

Short-term risks and impacts will be minimal. Impacted material will remain on-site with minimal disturbance during cap installation; all appropriate health and safety precautions and soil erosion control measures will be taken during construction. The cap, with routine inspections/maintenance, and Deed Notice are proven methods of providing reliable, long-term protection.

The cap will contain the impacted soil, and the cap and Deed Notice will reduce the risk of direct contact with impacted soil. Direct contact with ground water will be minimized or eliminated because ground water in this area is not currently used and future use will be limited by the CEA. A CEA is a proven remedial action that provides short-and long-term protection.

Additionally, regrading associated with cap installation and the low permeability cap structure will minimize infiltration, which will reduce the ground water elevation beneath the cap, thereby reducing the volume of water that could potentially be impacted by arsenic soils. This, in turn, will mitigate the potential for off-site migration of contaminants.

The contaminants of concern (arsenic and lead) do not volatilize, and hence do not represent a potential for exposure to migrate through an asphalt or concrete cap in the vapor phase. The cap would completely eliminate the potential for direct exposure to humans with lead and arsenic in soil.

(2) Implementability:

Capping with a Deed Notice and a CEA are all proven remedial actions that are readily implementable at the site.

Additionally, Edgewater Enterprises, the property owner, will record a Deed Notice for the site.

(3) Consistency with applicable Federal, State and local laws and regulations:

All requirements for installation and monitoring will be followed to satisfy applicable laws and regulations. All required permits and approvals would be obtained.

(4) Potential impacts on the local community:

Capping will be consistent with the current development plans for the site. Current plans call for the Arsenic Area to be an access road to the Edgewater development, so minor modifications would be needed to ensure that the planned roadway complies with the engineering requirements for a cap. Any planned landscape areas in the current site plans will be modified to include either a concrete bottom to planting areas, or a geotextile membrane covered by 12 to 24 inches of clean fill and topsoil.

Capping would be sufficiently flexible so as not to interfere with future remedial decisions for the adjacent Quanta site. Should the USEPA decide in the future that arsenic concentrations on the Quanta site warrant active remediation (such as excavation, ex-situ treatment, in-situ treatment, or physical barriers), and if it is determined by the USEPA and the NJDEP that the remedy should be extended to include a portion of the former Celotex site, the cap could be removed to allow for the implementation of the selected remedy.

The construction of the cap for the creation of an access road to the site is consistent with the Borough of Edgewater's Master Plan. In a resolution passed on September 11, 2000, the Borough granted Edgewater Enterprises Site Plan approval. In this resolution it is stated "The Planning Board finds that the applicant's developmental plan is consistent with the goals and objectives of the Master Plan. This plan takes advantage of the Hudson River by providing physical and visual access to the Riverfront. This plan will enhance the public use and enjoyment of the shoreline...

"The Board also find that this project is consistent with the Master Plan's goals and objectives for the re-alignment of River Road and Gorge Road intersection and the use of the roads by vehicular traffic from this site. These improvements are necessary for safe and efficient transportation and also to accommodate future growth."

In a resolution passed March 27, 2000 for the adjacent (to the north) movie theater development, the Borough granted amended site plan approval. In this approval, the Borough set as a condition "The applicant has affirmed that they will construct the southern access road from the site to Gorge Road in accordance with condition no. 7 of Resolution No. 4-27-98-1. The construction of this road must be completed prior to a certificate of occupancy being issued for the movie theater."

The movie theater at Glenwood Mall has been allowed to open with the understanding that this condition will be met in the near future. The access road that will be built as part of the proposed cap is therefore an integral component of the Borough's development plans for the entire waterfront.

(5) Potential to cause adverse environmental conditions:

No wetlands or surface waters will be adversely impacted by the selected remedial action.

Additional explanation of how the selected remedial action for the Arsenic Area satisfies the NJDEP remedial action selection factors is provided in Table I. A detailed description of the selected remedial action, including specifications for engineering and institutional controls and a plan for monitoring for such controls is provided in Section 5.0.

The cost to implement this remedial action is estimated to be $1.1 million in capital costs, and $1 million in operation and maintenance (O&M) costs (Table II).

4.1.2 Remedial Alternative No. 2

Remedial Alternative No. 2 is also a limited restricted use remedial action (capping with a Deed Notice for soil, slurry wall with pump and treat, and a CEA for ground water outside of the slurry wall) that is consistent with the containment and exposure control remediation approach presented in Section 3.0. In this remedial alternative, a bentonite slurry wall would completely encircle the area with soil concentrations greater than the applicable remediation standards (see Figure 8). The slurry wall would be keyed into bedrock. It also includes a low permeability cap, and a ground water collection system to maintain an inward hydraulic gradient across the barrier.

The cost to implement this remedial alternative is significantly more than Remedial Alternative No. 1 (capping with a Deed Notice for soil and a CEA for ground water). The cost to implement this remedial action is estimated to be $2.7 million in capital costs, and $3.8 million in O&M costs (Table II).

As outlined below, this remedial alternative will not minimize short-term risk and impacts [per N.J.A.C. 7:26E-5.1(c)1.iv]; and may not be consistent with the ultimate USEPA approach for the adjacent Quanta site [per N.J.A.C. 7:26E-5.1(c)4].

(1) Ability to protect the public health and safety and the environment:

Short-term risks and impacts for a slurry wall will be greater than for the selected remedial action, but could be minimized to the extent practicable by ensuring: all appropriate health and safety precautions are taken during slurry wall installation; and impacted soil that is excavated during slurry wall construction is placed on site under the cap.

(2) Potential impacts on the local community:

The installation of a slurry wall around the Arsenic Area on the former Celotex site may not be compatible with the remedy ultimately selected for the adjacent Quanta site. Should the USEPA decide that removal, in-situ treatment, or physical barriers are required for arsenic-impacted soil on the Quanta site, the existence of a slurry wall that bisects the area high arsenic concentration may interfere with the implementation of the selected remedy.

See Table I for further explanation of how this remedial alternative compares to the selected remedial alternative with respect to compliance with the NJDEP remedial action selection factors at N.J.A.C. 7:26E-5.1(c) 1 through 5.

4.1.3 Remedial Alternative No. 3

Remedial Alternative No. 3 is a limited restricted use remedial action (excavation of shallow soils and capping with a Deed Notice for deeper soils, slurry wall with pump and treat and a CEA for ground water outside of the slurry wall area). It is a combination of the containment and exposure control remediation approach presented in Section 3.0 and active treatment.

The cost to implement this remedial alternative is significantly more than Remedial Alternative No. 1 (capping with a Deed Notice for soil and a CEA for ground water). Excavation of the Arsenic Area to the water table, with sheet piling or slurry walls (potentially with tie-backs) adjacent to a major roadway, and the long-term pumping and treating of water, represents a project of considerable technical difficulty and great cost. The cost to implement this remedial action is estimated to be $5.4 million in capital costs, and $3.7 million in O&M costs (Table II). A project of this magnitude is beyond the financial resources of Edgewater Enterprises, and renders the entire development of the site infeasible.

This remedial alternative will not minimize short-term risk and impacts [per N.J.A.C. 7:26E-5.1(c)1.iv]; is severely limited in terms of its implementability [per N.J.A.C. 7:26E-5.1(c)2]; has the potential for negative impact on the local community, and may not be consistent with the ultimate USEPA approach for the adjacent Quanta site [per N.J.A.C. 7:26E-5.1(c)4].

Edgewater Enterprises and DRAI have serious concerns that excavation of the Arsenic Area to the water table may not be practicable for a variety of engineering, community, environmental and economic factors, as outlined below.

(1) Ability to protect the public health and safety and the environment:

Short-term risks and impacts for even a shallow soil excavation will be significantly greater than for the selected remedial action. Excavation adjacent to River Road would present significant danger to the integrity of this major thoroughfare. This remedial alternative presents many technical difficulties, and does not completely remove the potential for significant damage to River Road.

(2) Implementability

Excavation to the water table in most of the Arsenic Area may be technically feasible. Sheet piling may be necessary adjacent to River Road to minimize the potential for slumping and collapse. Driving sheet piles in the heterogeneous fill, which contains boulders and slabs, will present significant technical difficulties.

(3) Potential impacts on the local community

Excavation immediately adjacent to River Road would probably require the closing of the road for discrete periods of time. It is possible that long-term closure may be required depending on the position of sheet piling and the extent of the excavation.

Catastrophic failure of portions of River Road during excavation would result in the loss of use of the road for long periods of time. Such a scenario would create undue hardship to the municipality, the county, and the residents and employees of this highly developed and densely populated portion of Bergen County. River Road is the only north-south thoroughfare adjacent to the Hudson River between the George Washington Bridge and the Lincoln Tunnel, and the community could not withstand loss of the road for a prolonged period of time.

Additionally, the time period required to conduct the removal and the shoring of River Road is far greater than the time period available to the developer to meet its financing and leasing requirements.

See Table I for an explanation of how this remedial alternative compares to the selected remedial alternative with respect to compliance with the NJDEP remedial action selection factors at N.J.A.C. 7:26E-5.1(c) 1 through 5.

4.1.4 Remedial Alternative No. 4

Remedial Alternative No. 4 is a limited restricted use remedial action (excavation of soils to bedrock, and a CEA for ground water outside of the excavation zone). It is an active treatment remediation approach.

The cost to implement this remedial action is significantly more than Remedial Alternative No. 1 (capping with a Deed Notice for soil and a CEA for ground water). Excavation of the Arsenic Area to bedrock, with the potential creation of sheet piling or slurry walls, and the pumping and treating of enormous volumes of water, represents a project of large technical difficulty and great cost. The cost to implement this remedial action is preliminarily estimated to be $11.8 million in capital costs, and $0.5 million in O&M costs (Table II). It is likely that the actual cost will be significantly higher by several million dollars. Factors that could raise the cost beyond what is currently incorporated into the preliminary cost estimate include: reduced excavation production rates with depth; the need for extensive tie backs or bracing for the sheet piling; increased dewatering and water treatment needs; and other currently unforeseen contingencies.

A project of this magnitude is beyond the financial resources of Edgewater Enterprises, and renders the entire development of the Site infeasible. The Brownsfield Act recognizes the need to adequately address historic contamination in a cost-effective manner. It should be noted that when the Administrative Consent Order was entered into in 1999 (well after the initial remedial investigation of the site had been submitted to the NJDEP), the bonding requirement was $1 million. Edgewater Enterprises has already spent far more than this, and requiring a removal costing in excess of $10 million is simply inequitable.

This remedial alternative will not minimize short-term risk and impacts [per N.J.A.C. 7:26E-5.1(c)1.iv]; is severely limited in terms of its implementability [per N.J.A.C. 7:26E-5.1(c)2]; has the potential for negative impact on the local community, and may not be consistent with the ultimate USEPA approach for the adjacent Quanta site [per N.J.A.C. 7:26E-5.1(c)4].

DRAI has noted serious engineering, community, environmental and economic concerns in its February 7, 2002 letter to the NJDEP regarding excavation of the Arsenic Area to depths as much as 30 to 40 ft bg (the anticipated depth to bedrock). All of the concerns associated

with Remedial Alternative No. 3 (regarding ability to protect the public health and safety and the environment, implementability, and potential impacts on the local community) apply equally, and more so, to this remedial alternative. Further excavation to bedrock adds the following factors, which would render this option not implementable.

(1) Implementability

Sheet piling would be required along all boundaries of the excavated areas to support the soils during excavation. Piling along the western and southern boundaries will also prevent the migration of arsenic and other contaminants from under River Road and the Quanta Site into the clean backfill. It is highly likely that conventional sheet piles may not be installed because the lateral support on one side will have been removed. The sheet pile would therefore not be stable.

Excavation adjacent to River Road would present significant danger to the integrity of this major thoroughfare. Given the inability to install conventional sheet piling if the lateral support has been removed from one side, the potential for collapse of this road would be high. Support for sheet piles can be provided through the installation of tie-backs. However, this engineering option presents many technical difficulties, and does not completely remove the potential for significant damage to River Road.

The fill under the Arsenic Area and River Road has been determined to be highly heterogeneous, with portions of old structures, voids, and other components that would not provide the necessary structural support and stability for tie-backs. If tie-backs were to be considered, they would probably have to be drilled into bedrock under River Road, creating conduits for the migration of contamination into currently unimpacted hydrogeologic units.

A serious concern is the potential for "boiling", as described in the OSHA Technical Manual (29 CFR 1926.650). Boiling is evidenced by an upward flow into the bottom of an excavation, often caused by a high water table. Boiling produces a "quick" condition from the bottom of the excavation, and can occur even when shoring or trench boxes are used, thereby causing a serious safety hazard. Other factors that can affect the soil stability in this area are vibrations from heavy traffic, pile driving or similar effects, as well as the soils having been previously disturbed/excavated. Many of these factors are present at the property, especially in close proximity of River Road.

The NJDEP recognizes that excavation is not feasible in all cases. In the NJDEP's 1998 document entitled *Revised Guidance Document for the Remediation of Contaminated Soils*, it states " Excavation to great depths or in complex hydrogeologic environments also can impact the use of excavation as a remedy and, in some instances, can make excavation technically impractical." For many reasons, including those cited above, excavation would be impractical for the Arsenic Area.

The volume of ground water that would have to be pumped to dewater the Arsenic Area for an excavation to bedrock would be enormous. This would create a pronounced inward hydraulic gradient from the adjoining property to the west (River Road) and south (Quanta), likely pulling any free product contamination from these areas

onto the Celotex property. Consequently, there is serious concern that any such activity could potentially mobilize large quantities of product from the adjoining areas. Shoring by sheet piling would limit but not eliminate the movement of such contamination.

Notwithstanding the concerns of potentially mobilizing free product from the Quanta site and from under River Road, the installation and operation of an adequate dewatering system for an excavation to bedrock is a daunting consideration in estimating the size of pumps that would be necessary to maintain a drawdown of 10 feet or more, the huge quantity of water that would need to be treated and disposed of, and the excessive costs involved, again with questionable benefit to the environment.

See Table I for an explanation of how this remedial alternative compares to the selected remedial alternative with respect to compliance with the NJDEP remedial action selection factors at N.J.A.C. 7:26E-5.1(c) 1 through 5.

4.2 Free Product

Discoloration of soil was noted in boring SB25, under the footprint of the planned 400 Building. A test pit was dug to evaluate this occurrence further. Apparent sheens were noted during excavation, but a sample of soil and water from the visually most impacted interval of the test pit that was transferred to a jar and allowed to settle overnight separated into black sediment and water, with no sheen or floating product. Laboratory analysis did not reveal the presence of volatile or semivolatile organic compounds at levels indicative of petroleum product. A letter report is being submitted as a companion document to this RASR describing the results of that evaluation. The accompanying letter report recommends that no further action is required for this discoloration.

Observations of the presence of floating product were noted by EWMA in test pits C3-1, C3-2 and C3-4, adjacent to River Road. EWMA reports that this product floated and had the appearance of waste oil. This product is associated with a known former waste oil storage area on the adjacent Quanta site. Remedy selection for this medium should be deferred until the USEPA selects a remedy for the source area on the adjacent Quanta site. To the extent that free product is determined to exist on-site, and is not associated with off-site sources, remediation of free and residual product beyond the selected remedy may be required.

5.0 SELECTED REMEDIAL ACTION

In accordance with the TRSR (N.J.A.C. 7:26E, *et seq.*) and based on the results of extensive soil and ground water quality data, a remedial action was selected for the Arsenic Area that will reduce or eliminate exposures to contaminants in the media of concern.

5.1 Selected Remedial Actions

The remediation approach for the Arsenic Area relies on engineering and institutional controls, and includes restricted use, containment and exposure control remedial actions for soil and ground water. The selected remedial actions are shown on Figure 8; a detailed description is given below:

The selected remedial action for impacted soil in the Arsenic Area is capping with a Deed Notice. The cap area includes all soils with arsenic and lead levels greater than or equal to the proposed remediation criteria of 1,000 and 10,000 ppm, respectively. The proposed extent of the cap is shown on Figure 8. Additionally, hot-spot removal of soils with elevated arsenic or lead concentrations beneath the footprint of Building 400 will be conducted.

The selected remedial action for impacted ground water in the Arsenic Area is a CEA of indefinite duration, with long-term monitoring. Pursuant to N.J.A.C. 7:9-6, et seq., a CEA will be proposed for areas which have exceedances of applicable ground water quality standards.

The proposed cap for the Arsenic Area is a single barrier (asphalt/concrete) type, which will provide a physical separation between the contaminants and humans, animals, and plant roots. The cap will also promote more effective surface drainage and re-direct runoff, thus reducing infiltration of water into the underlying media and minimizing impacts to ground water. The material under the impermeable cap will be well compacted to minimize damage from differential settlement.

Capping preparation and installation will include:

(1) Hot-spot removal of arsenic soils greater than 1000 ppm that will be located under the footprint of proposed buildings (see Figure 8). The current estimated volume of soils to be excavated is approximately 2,700 cubic yards, of which approximately 800 cubic yards (the upper fill material) will be sampled under a Soil Reuse Plan for reuse as backfill for the hot-spot excavation, and approximately 1,900 cubic yards will be placed under the proposed cap for the Arsenic Area.

    The volume of soil discussed above is based on the current results of the RI. Additional soil sampling will be conducted in an attempt to reduce the horizontal and vertical extent of the hot-spot excavation.

(2) Placement of the soil that is excavated during hot spot removal. The amount of excavated soil placed under the cap will be dependent on the grading plan.

(3) Regrading to re-direct storm-water runoff, thereby preventing storm-water accumulation and reducing infiltration to the Arsenic Area. After regrading, the soil will be compacted to create an appropriate soil subgrade (protective layer) for cap placement.

(4) Cap installation. The cap thickness will be approximately 12 inches. The cap includes the placement of the layers listed below (listed in order of placement, from top of contaminated materials to visible top).

- Barrier layer (40 mil thick synthetic or geosynthetic liner)
- Drainage layer (6 inches of granular soil or geosynthetic drainage material).
- Protective layer (6 inches Asphalt/concrete)

(5) Supplemental Ground Water RI. Additional wells will be installed, in accordance with a workplan to be approved by the NJDEP, to provide a comprehensive ground water characterization and to serve as the basis for the design of the long-term monitoring program. Additional shallow, deeper overburden, and bedrock monitoring wells will be installed; these new wells and older wells that are deemed useable after inspection will be sampled twice prior to selecting the network for the long-term monitoring program that will be part of the CEA.

5.2 Compliance with Remedial Action Selection Criteria

The selected remedial action for the Arsenic Area complies with the remedial action selection criteria requirements specified in the TRSR, N.J.A.C. 7:26E-5.1(c) 1 through 5 (see Section 4.1.1 and Table II).

5.3 Maintenance and Monitoring

In accordance with the TRSR, N.J.A.C. 7:26E-6.4(g), the following measures will be taken by Edgewater Enterprises to ensure that the restricted use remedial actions for the Arsenic Area will continue to be protective of public health safety and the environment:

(1) Periodic inspections of the cap will be made to determine if it is operating as designed and intended. The cap will be maintained as necessary;

(2) Periodic inspections of the site will be made to determine that the land use does not violate the institutional control (Deed Notice);

(3) Periodic monitoring of the ground water will be conducted to determine if the selected remedial actions are effective; and

(4) Monitoring reports will be submitted approximately every 2 years (i.e., biennial certification) to the NJDEP certifying compliance (in accordance with N.J.A.C. 7:26E-6.4(g)4).

5.4 Required Information

The plans proposed in this RASR will be refined in the Remedial Action Workplan (RAW) based on obtaining additional site-specific information related to permits and construction feasibility. This information, includes, but is not limited to, the following:

(1) Supplemental Ground Water RI – the results of the upcoming ground water RI will be used to verify the fate and transport of arsenic in ground water and establish a CEA .

(2) Physical obstructions or hazards and site access – perform a comprehensive site inspection to mark-out any utilities, pipelines, roads, etc. and the location of future buildings for the purpose of defining the boundaries of the cap, and the locations for hot spot excavation.

(3) Additional data – any additional data collected will be used to refine the selected remedial actions, as necessary.

FIGURES

CENTRAL PARK QUADRANGLE, N.Y.–N.J.
1966
PHOTOREVISED 1979
7.5 MINUTE SERIES (Topographic)

0 2000 FT.
APPROXIMATE SCALE

N

NEW YORK
QUADRANGLE LOCATION

Dan Raviv Associates, Inc.
57 E. Willow Street Millburn, NJ 07041

SITE LOCATION

Former Celotex Industrial Park – Edgewater, NJ	
PREPARED BY: RKH/ODL	DATE: APRIL 2002
JOB NO.: 01C2084	FIGURE: 1

2084SLM –04/11/02

304805

VERTICAL DELINEATION BORINGS

C3-4

Depth	1.5-2.0	3.5-4.0	5.5-6.0	6.5-7.0	9.5-10	14.5-15		20-20.5
Elevation	10.8-10.3	8.8-8.3	6.8-6.3	5.8-5.3	2.8-2.3	-2.2 to -2.7		-7.7 to -8.2
Date	03/26/02	03/26/02	06/08/00	06/08/00	06/08/00	06/08/00	03/26/02	03/22/02
As	50.3	252	14.8	352	853	1830	931	4.47
Pb	306	979	84	1070	17300	1040	6700	7.99
Sb	ND	3.41	NA	NA	NA	NA	67.6	ND
Cu	72.1	205	NA	NA	NA	NA	1590	12.6
Tl	0.45	3.32	NA	NA	NA	NA	2.05	ND
Other PP-Metals	<SCC	<SCC	NA	NA	NA	NA	<SCC	<SCC
Napthalene	1.96	465	NA	NA	NA	NA	6.77	ND
Acenapthene	0.206	686	NA	NA	NA	NA	2.14	0.094
Fluorene	1.66	519	NA	NA	NA	NA	2.17	0.083
Anthracene	2.55	720	NA	NA	NA	NA	2.24	ND
Fluoranthene	18.4	4590	NA	NA	NA	NA	8.09	0.089
Pyrene	11.6	3860	NA	NA	NA	NA	7.81	0.069
B(a)A	8.74	2710	NA	NA	NA	NA	3.72	ND
Chrysene	9.16	2880	NA	NA	NA	NA	4.31	ND
B(b)F	10.2	3010	NA	NA	NA	NA	3.65	ND
B(k)F	6.34	1190	NA	NA	NA	NA	3.57	ND
B(a)P	10.1	2360	NA	NA	NA	NA	4.23	ND
I(1,2,3-cd)P	5.51	1530	NA	NA	NA	NA	2.47	ND
D(a,h)A	1.97	505	NA	NA	NA	NA	1.07	ND
Benzene	NA	0.251	NA	NA	NA	NA	ND	ND
Other VOCs	NA	<SCC	NA	NA	NA	NA	<SCC	NA
Pesticides	NA	<SCC	NA	NA	NA	NA	ND	NA
PCBs	NA	ND	NA	NA	NA	NA	ND	NA
Cyanide	NA	<SCC	NA	NA	NA	NA	ND	NA

C3-5

Depth	1.5-2.0	3.5-4.0	5.5-6.0	7.5-8.0	10-10.5	14.5-15		15.5-16	20-20.5
Elevation	10.8-10.3	8.8-8.3	6.8-6.3	4.8-4.3	2.3-1.8	-2.2 to -2.7		-3.2 to -3.7	-7.7 to -8.2
Date	03/26/02	03/26/02	06/08/00	06/08/00	3/22/02	06/08/00	03/22/02	06/08/00	03/22/02
As	88.7	39.5	22.3	549	732	7130	3600	4740	28.6
Pb	269	132	98.9	1680	4130	16000	8910	126	59.9
Sb	ND	NA	NA	NA	59.5	NA	37.5	NA	ND
Cu	59.2	NA	NA	NA	943	NA	851	NA	21.6
Hg	2.46	NA	NA	NA	20.8	NA	20.1	NA	0.089
Tl	0.28	NA	NA	NA	ND	NA	4.51	NA	ND
Other PP-Metals	<SCC	NA	NA	NA	<SCC	NA	<SCC	NA	<SCC
Napthalene	0.671	NA	NA	NA	912	NA	306	NA	ND
Acenapthene	1.21	NA	NA	NA	325	NA	118	NA	ND
Fluorene	1.13	NA	NA	NA	291	NA	124	NA	ND
Anthracene	2.2	NA	NA	NA	220	NA	79.3	NA	0.091
Fluoranthene	9.7	NA	NA	NA	302	NA	141	NA	0.306
Pyrene	7.97	NA	NA	NA	198	NA	108	NA	0.213
B(a)A	5.23	NA	NA	NA	74.3	NA	35.8	NA	0.083
Chrysene	5.2	NA	NA	NA	68.7	NA	33.4	NA	0.073
B(b)F	5.37	NA	NA	NA	45	NA	17.6	NA	ND
B(k)F	1.9	NA	NA	NA	18.2	NA	22.4	NA	ND
B(a)P	4.11	NA	NA	NA	36	NA	24.5	NA	ND
I(1,2,3-cd)P	2.62	NA	NA	NA	18.2	NA	10.4	NA	ND
D(a,h)A	0.831	NA	NA	NA	5.36	NA	4.14	NA	ND
Benzene	0.958	2.01	NA	NA	ND	NA	ND	NA	ND
Other VOCs	<SCC	<SCC	NA	NA	<SCC	NA	<SCC	NA	NA
Pesticides	<SCC	NA	NA	NA	ND	NA	ND	NA	NA
PCBs	ND	NA	NA	NA	ND	NA	ND	NA	NA
Cyanide	ND	NA	NA	NA	ND	NA	ND	NA	NA

C3-6

Depth	1.5-2.0	3.5-4.0	5.5-6.0	7.5-8.0	11-11.5	13.5-14		15-15.5	21.5-22
Elevation	10.4-9.9	8.4-7.9	6.4-5.9	4.4-3.9	0.9-0.4	-1.6 to -2.1		-3.1 to -3.6	-9.6 to -10.1
Date	03/26/02	03/26/02	06/08/00	06/08/00	06/08/00	06/08/00	03/26/02	03/21/02	03/21/02
As	167	449	22	244	2550	4320	6550	1450	10.8
Pb	694	1030	170	1540	5280	141	695	3210	22.2
Cu	NA	108	NA	NA	NA	NA	453	727	20.3
Tl	NA	2.05	NA	NA	NA	NA	6.53	11.9	0.119
Other PP-Metals	NA	<SCC	NA	NA	NA	NA	<SCC	<SCC	<SCC
B(a)A	NA	3.19	NA	NA	NA	NA	2.41	6.14	ND
B(b)F	NA	2.88	NA	NA	NA	NA	1.45	4.96	ND
B(k)F	NA	1.31	NA	NA	NA	NA	2.24	1.87	ND
B(a)P	NA	2.33	NA	NA	NA	NA	2.18	3.97	ND
I(1,2,3-cd)P	NA	1.46	NA	NA	NA	NA	1.05	2.26	ND
D(a,h)A	NA	0.457	NA	NA	NA	NA	0.489	0.639	ND
Benzene	NA	0.213	NA	NA	NA	NA	2.01	1.35	ND
Other VOCs	NA	<SCC	NA	NA	NA	NA	<SCC	NA	NA
Pesticides	NA	<SCC	NA	NA	NA	NA	ND	NA	NA
PCBs	NA	ND	NA	NA	NA	NA	ND	NA	NA
Cyanide	NA	2.33	NA	NA	NA	NA	ND	NA	NA

C3-10

Depth	1.0-1.5	3.5-4.0	5.5-6.0	6.5-7.0	7.5-8.0		15-15.5	20-20.5	25-25.5	30-30.5
Elevation	12.1-11.6	9.6-9.1	7.6-7.1	6.6-6.1	5.6-5.1		-1.9 to -2.4	-6.9 to -7.4	-11.9 to -12.4	-16.9 to -17.4
Date	03/25/02	03/25/02	06/08/00	06/08/00	06/08/00	03/25/02	03/25/02	03/25/02	03/25/02	03/25/02
As	6.69	6.33	950	778	6470	686	5360	721	52.3	NA
Pb	81.2	58.8	1200	1910	35000	1940	421	NA	NA	NA
Cu	39	NA	NA	NA	NA	261	1190	NA	34.8	NA
Tl	0.561	NA	NA	NA	NA	19.3	88.7	NA	0.61	NA
Other PP-Metals	<SCC	NA	NA	NA	NA	<SCC	<SCC	NA	NA	NA
B(a)A	2	NA	NA	NA	NA	4.02	ND	NA	NA	NA
B(b)F	2.65	NA	NA	NA	NA	4.72	ND	NA	NA	NA
B(k)F	0.96	NA	NA	NA	NA	5.53	ND	NA	NA	NA
B(a)P	1.82	NA	NA	NA	NA	5.5	ND	NA	NA	NA
I(1,2,3-cd)P	1.25	NA	NA	NA	NA	3.66	ND	NA	NA	NA
D(a,h)A	0.397	NA	NA	NA	NA	1.83	ND	NA	NA	NA
Benzene	ND	ND	NA	NA	NA	ND	0.805	NA	NA	NA
Other VOCs	<SCC	ND	NA	NA	NA	ND	NA	NA	NA	NA
Pesticides	<SCC	NA	NA	NA	NA	ND	NA	NA	NA	NA
PCBs	ND	NA	NA	NA	NA	ND	NA	NA	NA	NA
Cyanide	ND	NA	NA	NA	NA	ND	NA	NA	NA	NA

C3-14

Depth	1.5-2.0	3.5-4.0	5.5-6.0	6.5-7.0	8.5-9.0		16.5-17	21.5-22
Elevation	11.2-10.7	9.2-8.7	7.2-6.7	6.2-5.7	4.2-3.7		-3.8 to -4.3	-8.8 to -9.3
Date	03/25/02	03/25/02	06/08/00	06/08/00	06/08/00	03/25/02	03/21/02	03/21/02
As	65.1	7.9	5.08	568	2490	79.8	134	326
Pb	475	59.7	52.2	10100	8160	1980	76.9	53.2
Tl	0.669	NA	NA	NA	NA	0.394	1.16	6.75
Other PP-Metals	<SCC	NA	NA	NA	NA	<SCC	<SCC	<SCC
B(a)A	0.429	NA	NA	NA	NA	15.0	ND	ND
B(b)F	0.473	NA	NA	NA	NA	21.7	ND	ND
B(k)F	0.186	NA	NA	NA	NA	11.2	ND	ND
B(a)P	0.343	NA	NA	NA	NA	18.5	ND	ND
I(1,2,3-cd)P	0.222	NA	NA	NA	NA	12.0	ND	ND
D(a,h)A	0.073	NA	NA	NA	NA	4.52	ND	ND
Benzene	ND	NA	NA	NA	NA	ND	ND	ND
Other VOCs	ND	NA	NA	NA	NA	ND	ND	ND
Pesticides	ND	NA	NA	NA	NA	<SCC	NA	NA
PCBs	ND	NA	NA	NA	NA	ND	NA	NA
Cyanide	ND	NA	NA	NA	NA	ND	NA	NA

C3-15

Depth	1.5-2.0	3.5-4.0	5.5-6.0	7.5-8.0	10.5-11		13.5-14	20-20.5	22.5-23
Elevation	11-10.5	9.0-8.5	7.0-6.5	5.0-4.5	2.0-1.5		-1.0 to -1.5	-7.5 to -8.0	-10 to -10.5
Date	03/25/02	03/25/02	06/08/00	06/08/00	06/08/00	03/25/02	06/08/00	03/20/02	03/20/02
As	286	360	4.79	49.2	6670	532	2480	206	34
Pb	10100	4260	83.1	8870	46000	9840	36310	29.1	7.77
Sb	9.63	NA	NA	NA	NA	26.4	NA	NA	ND
Hg	75.2	NA	NA	NA	NA	56.4	NA	NA	0.024
Se	157	NA	NA	NA	NA	152	NA	NA	ND
Other PP-Metals	<SCC	NA	NA	NA	NA	<SCC	NA	NA	<SCC
Fluoranthene	105	NA	NA	NA	NA	7.12	NA	NA	ND
B(a)A	60	NA	NA	NA	NA	4.06	NA	NA	ND
Chrysene	57	NA	NA	NA	NA	4.3	NA	NA	ND
B(b)F	59.6	NA	NA	NA	NA	4.11	NA	NA	ND
B(k)F	20.6	NA	NA	NA	NA	4.66	NA	NA	ND
B(a)P	44.8	NA	NA	NA	NA	5.05	NA	NA	ND
I(1,2,3-cd)P	26.5	NA	NA	NA	NA	2.78	NA	NA	ND
D(a,h)A	1.92	NA	NA	NA	NA	1.28	NA	NA	ND
Benzene	ND	NA	NA	NA	NA	ND	NA	NA	ND
Other VOCs	ND	NA	NA	NA	NA	ND	NA	NA	ND
Pesticides	<SCC	NA	NA	NA	NA	<SCC	NA	NA	NA
PCBs	ND	NA	NA	NA	NA	<SCC	NA	NA	NA
Cyanide	1.2	NA	NA	NA	NA	ND	NA	NA	NA

C3-18

Depth	1.5-2.0	3.5-4.0	5.5-6.0	6.5-7.0	11.5-12	13.5-14		20-20.5
Elevation	11.2-10.7	9.2-8.7	7.2-6.7	6.2-5.7	1.2-0.7	-0.8 to -1.3		-7.3 to -7.8
Date	03/25/02	03/25/02	06/08/00	06/08/00	06/08/00	06/08/00	03/25/02	03/20/02
As	584	526	12.7	78.3	667	4040	126	4.19
Pb	3320	2970	260	5460	23500	67.3	790	14.3
Hg	53.7	NA	NA	NA	NA	NA	9.56	ND
Se	82	NA	NA	NA	NA	NA	11.7	ND
Other PP-Metals	<SCC	NA	NA	NA	NA	NA	<SCC	<SCC
B(a)A	0.608	NA	NA	NA	NA	NA	2.62	ND
B(b)F	6.64	NA	NA	NA	NA	NA	2.94	ND
B(k)F	2.57	NA	NA	NA	NA	NA	2.88	ND
B(a)P	5.04	NA	NA	NA	NA	NA	3.18	ND
I(1,2,3-cd)P	3.32	NA	NA	NA	NA	NA	1.84	ND
D(a,h)A	1.03	NA	NA	NA	NA	NA	0.849	ND
Benzene	ND	NA	NA	NA	NA	NA	ND	ND
Other VOCs	ND	NA	NA	NA	NA	NA	ND	ND
Pesticides	<SCC	NA	NA	NA	NA	NA	<SCC	NA
PCBs	ND	NA	NA	NA	NA	NA	ND	NA
Cyanide	ND	NA	NA	NA	NA	NA	ND	NA

C3-19

Depth	1.5-2.0	3.5-4.0	5.5-6.0	6.5-7.0	7.5-8.0		15-15.5	20-20.5
Elevation	10.6-10.1	8.6-8.1	6.6-6.1	5.6-5.1	4.6-4.1		-2.9 to -3.4	-7.9 to -8.4
Date	03/25/02	03/25/02	06/08/00	06/08/00	06/08/00	03/25/02	03/21/02	03/21/02
As	210	9580	8.72	345	3030	1950	80.8	469
Pb	455	10000	111	5920	25400	2830	59.7	NA
Cu	271	4670	NA	NA	NA	1690	11.3	NA
Hg	1.45	18.1	NA	NA	NA	3.73	0.205	NA
Tl	2.38	83	NA	NA	NA	18.9	2.28	5.55
Zn	99.2	2160	NA	NA	NA	957	NA	NA
Other PP-Metals	<SCC	<SCC	NA	NA	NA	<SCC	<SCC	NA
B(a)A	NA	0.806	NA	NA	NA	3.88	ND	NA
Chrysene	NA	0.981	NA	NA	NA	4.88	ND	NA
B(b)F	NA	1.04	NA	NA	NA	4.03	ND	NA
B(k)F	NA	0.4	NA	NA	NA	3.63	ND	NA
B(a)P	NA	0.654	NA	NA	NA	4.44	ND	NA
I(1,2,3-cd)P	NA	0.514	NA	NA	NA	2.28	ND	NA
D(a,h)A	NA	0.17	NA	NA	NA	1.03	ND	NA
Benzene	NA	ND	NA	NA	NA	ND	ND	NA
VOCs	NA	ND	NA	NA	NA	ND	ND	NA
Pesticides	NA	ND	NA	NA	NA	ND	ND	NA
PCBs	NA	ND	NA	NA	NA	ND	NA	NA
Cyanide	NA	ND	NA	NA	NA	ND	NA	NA

B10-0

Depth	0.5	3.5
Elevation	8.3	5.3
Date	06/14/00	06/14/00
As	90	3440
Pb	NA	NA

B11-0

Depth	0.5	3.5
Elevation	8.5	5.5
Date	06/14/00	06/14/00
As	2650	35100
Pb	NA	NA

B12-0

Depth	0.5	3.5
Elevation		
Date	06/14/00	06/14/00
As	130	12000
Pb	NA	NA

B18-0

Depth	0.5
Elevation	
Date	06/15/00
As	3900
Pb	NA

TEST PITS

C3-1

Depth	3.5-4.0	4.0-4.5	9.5-10.0	13.5-14.0
Elevation	7.9-7.4	7.4-6.9	1.9-1.4	-2.1 to -2.6
Date	06/08/00	06/08/00	06/08/00	06/08/00
As	16.8	224	159	3.08
Pb	267	1610	6310	50.2

C3-2

Depth	5.5-6.0	7.5-8.0	9.5-10.0	11.5-12.0
Elevation	7.2-6.7	5.2-4.7	3.2-2.7	1.2-0.7
Date	06/08/00	06/08/00	06/08/00	06/08/00
As	7.92	251	65700	1680
Pb	110	574	2930	34.7

C3-3

Depth	5.5-6.0	7.5-8.0	14.5-15.0
Elevation	8.0-7.5	6.0-5.5	-1.0 to -1.5
Date	06/08/00	06/08/00	06/08/00
As	104	2240	32.2
Pb	158	2060	29.5

C3-7

Depth	5.5-6.0	7.5-8.0	11.5-12.0	13.5-14.0
Elevation	4.5-4.0	2.5-2.0	-1.5 to -2.0	-3.5 to -4.0
Date	06/08/00	06/08/00	06/08/00	06/08/00
As	28.2	139	5000	69.8
Pb	198	3030	14900	196

C3-8

Depth	5.5-6.0	7.5-8.0	11.5-12.0	12.5-13.0
Elevation	5.7-5.2	3.7-3.2	-0.3 to -0.8	-1.3 to -1.8
Date	06/08/00	06/08/00	06/08/00	06/08/00
As	10.4	2250	1840	938
Pb	81.9	2830	15500	326

C3-9

Depth	5.5-6.0	7.5-8.0	11.5-12.0	12.5-13.0
Elevation	6.1-5.6	4.1-3.6	0.1 to -0.4	-0.9 to -1.4
Date	06/08/00	06/08/00	06/08/00	06/08/00
As	17.2	535	1390	687
Pb	140	4460	43400	352

C3-11

Depth	5.5-6.0	6.5-7.0	11.5-12.0	12.0-12.5	13.5-14.0
Elevation	7.4-6.9	6.4-5.9	1.4-0.9	0.9-0.4	-0.6 to -1.1
Date	06/08/00	06/08/00	06/08/00	06/08/00	06/08/00
As	64.4	271	6550	3090	458
Pb	374	3920	9070	300	69.1

C3-12

Depth	4.5-5.0	5.5-6.0	11.5-12.0	12.5-13.0
Elevation	8.0-7.5	7.0-6.5	1.0-0.5	0.0 to -0.5
Date	06/08/00	06/08/00	06/08/00	06/08/00
As	14.8	85.7	2150	184
Pb	161	4670	32300	50.5

C3-13

Depth	5.5-6.0	6.5-7.0	11.5-12.0	12.5-13.0
Elevation	6.6-6.1	5.6-5.1	0.6-0.1	-0.4 to -0.9
Date	06/08/00	06/08/00	06/08/00	06/08/00
As	5.12	990	2660	522
Pb	145	1000	5080	108

C3-16

Depth	5.5-6.0	6.5-7.0	10.5-11.0
Elevation	5.8-5.3	4.8-4.3	0.8-0.3
Date	06/08/00	06/08/00	06/08/00
As	15.3	480	503
Pb	155	3640	5890

C3-17

Depth	5.5-6.0	6.5-7.0	10.5-11.0	13.5-14.0
Elevation	7.0-6.5	6.0-5.5	2.0-1.5	-1.0 to -1.5
Date	06/08/00	06/08/00	06/08/00	06/08/00
As	13.2	298	451	528
Pb	211	2720	2710	161

C3-20

Depth	5.5-6.0	6.5-7.0	11.5-12.0	13.5-14.0
Elevation	9.3-8.8	8.3-7.8	3.3-2.8	1.3-0.8
Date	06/08/00	06/08/00	06/08/00	06/08/00
As	58.6	109	691	410
Pb	236	2150	747	69

C3-21

Depth	5.5-6.0	6.5-7.0	11.5-12.0	12.5-13.0
Elevation	9.8-9.3	8.8-8.3	3.8-3.3	2.8-2.3
Date	06/08/00	06/08/00	06/08/00	06/08/00
As	7.25	22	785	34.4
Pb	140	920	13400	39.8

U15, C79 & TP-1

U15

Depth	9.0-9.5	10-11	10-10.5	12.-12.5
Elevation	6.3-5.8	5.3-6.3	5.3-4.8	3.3-2.8
Date	04/12/02	02/05/02	03/28/02	04/12/02
As	161	1100	57.3	186
Pb	180	NA	18	7.79

C-79

Depth	0.5-1.0			
	A	B	C	D
Elevation	10.8-10.3	10.8-10.3	10.8-10.3	10.8-10.3
Date	03/25/02	03/25/02	03/25/02	03/25/02
As	102	9.23	11.5	70.2
Pb	1660	148	84.4	390

TP-1

Depth	7-7.5	10-10.5
Elevation	5.2-4.7	2.2-1.7
Date	4/12/02	4/12/02
As	215	6.26
Pb	2070	24.3
Tl	2.79	ND
Other PP-Metals	<SCC	<SCC
B(a)A	19.3	ND
Chrysene	20.5	ND
B(b)F	23.4	ND
B(k)F	14	ND
B(a)P	20.4	ND
I(1,2,3-cd)P	12.8	ND
D(a,h)A	5.25	ND
Other SVOCs	<SCC	<SCC
VOCs	<SCC	<SCC
Pesticides	<SCC	ND
PCBs	ND	ND
PHCs	<SCC	ND

OTHERS

B13-0 6/15/00 GSC	
Sample Depth	Arsenic (ppm)
0.5	379

B14-0 6/15/00 GSC	
Sample Depth	Arsenic (ppm)
0.5	626
3.5	439

B15-0 6/15/00 GSC	
Sample Depth	Arsenic (ppm)
0.5	250
3.5	358

B16-0 6/15/00 GSC	
Sample Depth	Arsenic (ppm)
0.5	134
3.5	1650

B17-0 6/15/00 GSC	
Sample Depth	Arsenic (ppm)
0.5	110
3.5	393

B19-0 6/15/00 GSC	
Sample Depth	Arsenic (ppm)
0.5	12

C-1 4/16/1997 ESI	
Sample Depth	Arsenic (ppm)
4.5-5.0	42.2

C-2 4/16/1997 ESI	
Sample Depth	Arsenic (ppm)
4.5-5.0	4.17

C-5 4/9/1997 ESI	
Sample Depth	Arsenic (ppm)
6.0-6.5	1.26
7.5-8.0	85.4

C-6 4/9/1997 ESI	
Sample Depth	Arsenic (ppm)
6.0-6.5	2.73
8.5-9.0	4.19

C-10 4/9/1997 ESI	
Sample Depth	Arsenic (ppm)
5.5-6.0	3.74
7.5-8.0	33.1

C-11 4/9/1997 ESI	
Sample Depth	Arsenic (ppm)
6.5-7.0	12.6
8.5-9.0	346

C-12 4/9/1997 ESI	
Sample Depth	Arsenic (ppm)
6.5-7.0	5.14
10.0-10.5	19.4

C-13 4/9/1997 ESI	
Sample Depth	Arsenic (ppm)
6.5-7.0	15.1
7.5-8.0	8.99

C-30A 4/10/1997 ESI	
Sample Depth	Arsenic (ppm)
0.0-0.5	6.08
5.5-6.0	6.94
8.5-9.0	67.2

C-61 4/17-22/1997 ESI	
Sample Depth	Arsenic (ppm)
0.0-0.5	10.6
4.5-5.0	8.59
7.5-8.0	16

C-78 4/20/1997 ESI	
Sample Depth	Arsenic (ppm)
0.0-0.5	5.68
3.5-4.0	4.08
11.5-12.0	17.8

C-80 4/20/97 ES1	
Sample Depth	Arsenic (ppm)
0-0.5	3.54
4.5-5.0	684

C-95 4/24/1997 ESI	
Sample Depth	Arsenic (ppm)
0.0-0.5	3.8
4.5-5.0	5.02
11.5-12.0	6.4

C-96 4/24/1997 ESI	
Sample Depth	Arsenic (ppm)
0.0-0.5	5.47
3.5-4.0	210
13.0-13.5	173

CC2-22 11/4/1999 EWMA	
Sample Depth	Arsenic (ppm)
7.5-8.0	983

CC2-28 11/4/1999 EWMA	
Sample Depth	Arsenic (ppm)
7.5-8.0	3.94

C2-2 6/25/1999 EWMA	
Sample Depth	Arsenic (ppm)
7.0-7.5	1528

C2-5 6/19/1999 EWMA	
Sample Depth	Arsenic (ppm)
8.0-8.5	28.7

C2-7 6/29/1999 EWMA	
Sample Depth	Arsenic (ppm)
8.0-8.5	104

PEC4-1 3/19/2000 EWMA	
Sample Depth	Arsenic (ppm)
5.5-6.0	3.48
7.5-8.0	27.9
10.0-10.5	11.1

PEC4-2 3/19/2000 EWMA	
Sample Depth	Arsenic (ppm)
5.5-6.0	8.42
7.5-8.0	10.2
10.0-10.5	3.08

PEC4-3 3/19/2000 EWMA	
Sample Depth	Arsenic (ppm)
5.5-6.0	3.17
7.5-8.0	44.9
10.0-10.5	4.28

PEC4-4 3/19/2000 EWMA	
Sample Depth	Arsenic (ppm)
5.5-6.0	4.5
7.5-8.0	22.6
10.0-10.5	5.14

PE4-5 3/19/00 EWMA	
Sample Depth	Arsenic (ppm)
10.0-10.5	9.44

PEC79-1 3/19/2000 EWMA	
Sample Depth	Arsenic (ppm)
4.5-5.0	20.8
6.5-7.0	6210
10.0-10.5	399

PEC79-2 3/19/2000 EWMA	
Sample Depth	Arsenic (ppm)
4.5-5.0	14.8
6.5-7.0	1000
10.0-10.5	2520

PEC79-3 3/19/00 EWMA	
Sample Depth	Arsenic (ppm)
10.0-10.5	1210

PEC79-4 3/19/2000 EWMA	
Sample Depth	Arsenic (ppm)
4.5-5.0	16.6
6.5-7.0	7300
10.0-10.5	2400

PEC79-5 3/19/2000 EWMA	
Sample Depth	Arsenic (ppm)
4.5-5.0	13
6.5-7.0	360
10.0-10.5	5880
13.5-14.0	46

M15 1/24/02 EWMA	
Sample Depth	Arsenic (ppm)
0-0.5	2.58
5-5.5	7.95
15-15.5	79.2

M18 1/24/02 EWMA	
Sample Depth	Arsenic (ppm)
0-0.5	6.58
2.5-3	4.36
10.5-11	27.1

M21 1/22/02 EWMA	
Sample Depth	Arsenic (ppm)
0-0.5	12.3
10.5-11	92.2

N11 2/27/02 EWMA	
Sample Depth	Arsenic (ppm)
7-9	4.13

N13 2/22/02 EWMA	
Sample Depth	Arsenic (ppm)
8.5-9	3.78

N15 1/24/02 EWMA	
Sample Depth	Arsenic (ppm)
0-0.5	3.89
4-4.5	5.12
15.5-16.0	11.7

N18 1/22/02 EWMA	
Sample Depth	Arsenic (ppm)
0-0.5	5.45
3-3.5	6.08
11-11.5	227

N21 1/22/02 EWMA	
Sample Depth	Arsenic (ppm)
0-0.5	7.5
4-4.5	19.8
10.5-11	9.72

R11 2/17/02 EWMA	
Sample Depth	Arsenic (ppm)
9.5-11.5	64.9

R13 3/4/02 EWMA	
Sample Depth	Arsenic (ppm)
8-11	27.3

R15 3/4/02 EWMA	
Sample Depth	Arsenic (ppm)
10-12	43.7

99175	
Sample Depth	Arsenic (ppm)
12	666

99172	
Sample Depth	Arsenic (ppm)
18	9.4

98323	
Sample Depth	Arsenic (ppm)
15.5	1.2

99173	
Sample Depth	Arsenic (ppm)
?	25.8

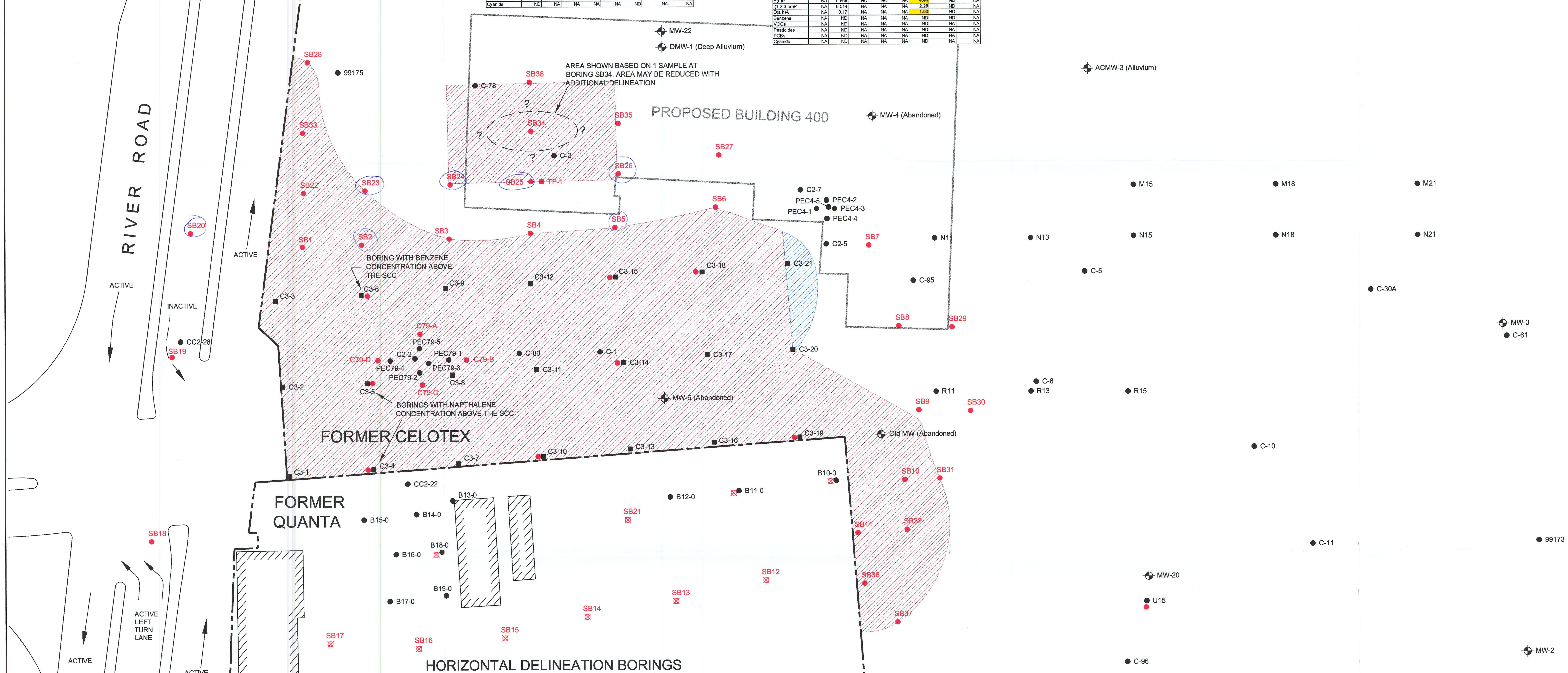
Parameter	USCC (ppm)	RSCC (ppm)	IGWSCC (ppm)
As = Arsenic	20	100*	–
Pb = Lead	400	600	–
Sb = Antimony	14	340	–
Cu = Copper	600	600	–
Hg = Mercury	14	270	–
Se = Selenium	63	3,100	–
Tl = Thallium	2	2	–
Zn = Zinc	1,500	1,500	–
Napthalene	230	4200	100
Acenapthene	3400	10000	100
Fluorene	2300	10000	100
Anthracene	10000	10000	100
Fluoranthene	2300	10000	100
Pyrene	1700	10000	100
B(a)A = benzo(a)anthracene	0.9	4	500
Chrysene	9	40	500
B(b)F = benzo(b)fluoranthene	0.9	4	50
B(k)F = benzo(k)fluoranthene	0.9	4	500
B(a)P = benzo(a)pyrene	0.66	0.66	100
I(1,2,3-cd)P = ideno(1,2,3-cd)pyrene	0.9	4	500
D(a,h)A = dibenzo (a,h)anthracene	0.66	0.66	100
Benzene	3	13	1
Pesticides	–	–	–
PCBs	0.49	2	50
Cyanide	1100	21000	–

* site specific standard
USCC = NJDEP's Unrestricted Use Soil Cleanup Criteria
RSCC = NJDEP's Restricted Use Soil Cleanup Criteria.
IGWSCC = NJEDP's Impact to Ground Water Soil Cleanup Criteria

For all compounds, except arsenic:
Bold indicates concentration above the USCC or IGWSCC, whichever is lower
Yellow shading indicates concentration above the RSCC.

For Arsenic only:
Red = concentration greater than 1,000 ppm
Orange = concentration greater than 100 ppm and less than 1,000 ppm
Bold = concentration above 20 ppm.

For Lead only:
Blue = concentration greater than 10,000 ppm
Yellow = concentration greater than 600 ppm and less than 10,000 ppm
Bold = concentration above 400 ppm



HORIZONTAL DELINEATION BORINGS

SB-1

Depth	4.4-4.9	6.8-7.3	15.9-16.4	23.4-23.9
Elevation	8.4-7.9	6.0-5.5	-3.1 to -3.6	-10.6 to -11.1
Date	03/27/02	03/27/02	03/27/02	03/27/02
As	6.93	3740	56.4	3.77
Pb	74.5	913	11	8
Sb	NA	29.6	NA	NA
Other PP-Metals	<SCC	<SCC	NA	<SCC
B(a)A	0.849	1.15	NA	ND
B(b)F	0.876	1.07	NA	ND
B(k)F	0.81	1.07	NA	ND
B(a)P	1.11	1.18	NA	ND
Other SVOCs	<SCC	<SCC	NA	ND
Benzene	NA	NA	NA	ND

SB-2

Depth	3.6-4.1	13.6-14.1	21.1-21.6
Elevation	8.4-7.9	-1.6 to -2.1	-9.1 to -9.6
Date	03/27/02	03/27/02	03/27/02
As	6.46	1080	9.57
Pb	126	416	18.6
Sb	NA	15.5	ND
Cu	35.8	833	19.2
Tl	0.132	4.09	ND
Other PP-Metals	<SCC	<SCC	<SCC
B(a)A	2.47	4.19	ND
B(b)F	2.87	1.74	ND
B(k)F	2.57	1.84	ND
B(a)P	3.09	2.15	ND
I(1,2,3-cd)p	2.14	0.866	ND
D(a,h)A	0.815	ND	ND
Other SVOCs	<SCC	<SCC	ND
Benzene	NA	NA	ND
Other VOCs	NA	NA	NA

SB-3

Depth	1.7-2.2	12-12.5	21.2-21.7	26.2-26.7
Elevation	10.4-9.9	0.1 to -0.4	-9.1 to -9.6	-14.1 to -14.6
Date	03/27/02	03/27/02	03/27/02	03/27/02
As	5.51	370	7.72	
Pb	81.4	416	32.6	
Tl	0.205	2.83	0.239	
Other PP-Metals	<SCC	<SCC	<SCC	
B(a)A	ND	5.15	ND	
B(b)F	ND	4.8	ND	
B(k)F	ND	3.59	ND	
B(a)P	ND	5.33	ND	
I(1,2,3-cd)P	ND	2.37	ND	
D(a,h)A	ND	0.954	ND	
Other SVOCs	ND	<SCC	ND	
Benzene			ND	

SB-4

Depth	12.5-13	22.5-23
Elevation	0.5-0.0	-9.5 to -10.0
Date	03/26/02	03/26/02
As	159	106
Pb	12.4	42.4
Tl	2.36	0.362
Other PP-Metals	<SCC	<SCC
PAHs	<SCC	ND
Other SVOCs	NA	ND
Benzene	NA	ND
Other VOCs	NA	ND
Pesticides	NA	NA
PCBs	NA	NA
Cyanide	NA	NA

SB-5

Depth	11.9-12.4	22.9-23.4
Elevation	1.5-1.0	-9.5 to -10.0
Date	03/27/02	03/27/02
As	256	4.27
Pb	673	13.1
Tl	2.25	0.19
Other PP-Metals	<SCC	<SCC
B(a)A	0.933	ND
B(a)P	0.917	ND
Other SVOCs	<SCC	ND
Benzene	NA	ND

SB-6

Depth	4.8-5.3	14.8-15.3	20.8-21.3
Elevation	9.2-8.7	-0.8 to -1.3	-6.8 to -7.3
Date	03/27/02	03/27/02	03/27/02
As	370	108	155
Pb	8340	44.5	1080
Hg	36.2	0.418	12.6
Tl	3.51	3.23	1.75
Other PP-Metals	<SCC	<SCC	<SCC
B(a)A	62.8	ND	0.292
Chrysene	64.3	ND	0.297
B(b)F	99.5	ND	0.289
B(k)F	63.2	ND	0.238
B(a)P	98.0	ND	0.298
I(1,2,3-cd)P	62.4	ND	0.173
D(a,h)a	28.2	ND	ND
Other SVOCs	<SCC	ND	<SCC

SB-7

Depth	1.5-2.0	5.5-6.0	7-7.5	12.4-12.9
Elevation	14.7-14.2	10.7-10.2	9.2-8.7	3.8-3.3
Date	03/27/02	03/27/02	03/27/02	03/27/02
As	5.06		NA	16.5
Pb	82.3		NA	32.9
Other PP-Metals	<SCC			<SCC
B(a)A	2.22			ND
B(b)F	2.34			ND
B(k)F	1.67			ND
B(a)P	2.51			ND
I(1,2,3-cd)P	1.54			ND
Other SVOCs	<SCC			ND

SB-8

Depth	1.5-2.0	5.7-6.2	7.7-8.2	13-13.5
Elevation	14.8-14.3	10.6-10.1	8.6-8.1	3.3-2.8
Date	03/28/02	03/28/02	03/28/02	03/28/02
As	11.9			223
Pb	362			42.5
Other PP-Metals	<SCC			<SCC
B(a)A	3.93			0.197
B(b)F	3.83			0.172
B(k)F	3.80			0.150
B(a)P	4.53			0.180
I(1,2,3-cd)P	2.90			0.102
D(a,h)A	1.16			ND
Other SVOCs	<SCC			<SCC

SB-9

Depth	1.5-2.0	3.5-4.0	5.8-6.3	7.8-8.3	11.8-12.3
Elevation	14.9-14.4	12.9-12.4	10.6-10.1	8.6-8.1	4.6-4.1
Date	03/28/02	03/28/02	03/28/02	03/28/02	03/28/02
As	33.2	28.6			183
Pb	202	221			1230
Other PP-Metals	<SCC	<SCC			<SCC
B(a)A	0.165	0.922			25.3
Chrysene	0.202	1.02			22.7
B(b)F	0.193	0.896			18.4
B(k)F	0.144	0.905			15.4
B(a)P	0.194	1.12			20.6
I(1,2,3-cd)P	0.137	0.675			9.44
D(a,h)A	ND	0.254			3.42
Other SVOCs	<SCC	<SCC			<SCC

SB-10

Depth	1.5-2.0	3.5-4.0	5.8-6.3	7.8-8.3	9.5-10	11.1-11.6	15.6-16.1	16.1-16.6
Elevation	14.9-14.4	12.9-12.4	10.6-10.1	8.6-8.1	6.9-6.4	5.3-4.8	0.8-0.3	0.3 to -0.2
Date	04/01/02	04/01/02	03/29/02	03/29/02	04/01/02	03/29/02	03/29/02	03/29/02
As	9.54	2.18				5400	1040	1360
Pb	75	17.2				98.7	NA	NA
Tl	0.211	0.243				3.27	NA	4.89
Other PP-Metals	<SCC	<SCC				<SCC	NA	NA
SVOCs	<SCC	<SCC				<SCC	NA	NA
VOCs						ND	NA	NA
Pesticides						ND	NA	NA
PCBs						ND	NA	NA
Cyanide						<SCC	NA	NA

SB-11

Depth	1.5-2.0	4.0-4.5	6.6-7.1	12.6-13.1	13.1-13.6	17.6-18.1	18.1-18.6	22.6-23.1
Elevation	10.6-10.1	8.1-7.6	5.5-5.0	-0.5 to -1.0	-1.0 to -1.5	-5.5 to -6.0	-6.0 to -6.5	-10.5 to -11
Date	03/29/02	03/29/02	03/29/02	03/29/02	03/29/02	03/29/02	03/29/02	03/29/02
As	10	54.9	365	37.2				
Pb	109	490	411	NA				
Tl	0.224	0.54	4.99	1.19				
Other PP-Metals	<SCC	<SCC	<SCC	<SCC				
B(a)A	3.75	48	0.848	ND				
Chrysene	4.08	55.2	1.01	ND				
B(b)F	4.42	88.1	1.13	ND				
B(k)F	3.16	31.1	0.362	ND				
B(a)P	4.59	62.1	0.745	ND				
I(1,2,3-cd)P	2.92	41.8	0.465	ND				
D(a,h)A	1.08	20	0.176	ND				
Other SVOCs	<SCC	<SCC	<SCC	ND				
VOCs	NA	NA	ND	NA	NA			
Pesticides	NA	NA	ND	NA	NA			
PCBs	NA	NA	ND	NA	NA			
Cyanide	NA	NA	<SCC	NA				

SB-18

Depth	9.2-9.7	18.5-19
Elevation	4.3 to 3.8	-0.5 to -5.5
Date	04/09/02	04/09/02
As	19.5	1.76
Pb	71.3	7.07
Other PP-Metals	<SCC	<SCC
B(a)A	18.2	0.1
Chrysene	14.8	0.096
B(b)F	9.77	ND
B(k)F	11.0	ND
B(a)P	12.5	0.074
I(1,2,3-cd)P	4.86	ND
D(a,h)A	1.90	ND
Other SVOCs	<SCC	<SCC
Benzene	0.98	NA
Other VOCs	NA	NA

SB-19

Depth	10.2-10.7	15.6-16.1	21.5-22
Elevation	3.2 to 2.7	-2.2 to -2.7	-8.1 to -8.6
Date	04/08/02	04/08/02	04/08/02
As	9.16	4.10	2.36
Pb	60.3	6.61	4.62
Other PP-Metals	<SCC	<SCC	NA
Fluoranthene	195	0.170	NA
Pyrene	116	0.125	NA
B(a)A	76.3	0.087	NA
Chrysene	63.5	0.070	NA
B(b)F	53.7	ND	NA
B(k)F	42.7	ND	NA
B(a)P	60.8	ND	NA
I(1,2,3-cd)P	29.6	ND	NA
D(a,h)A	10.9	ND	NA
Other SVOCs	<SCC	<SCC	NA
Benzene	1.21	ND	NA
Other VOCs	NA	NA	NA

SB-20

Depth	7.8-8.3	15.4-15.9	22.9-23.4
Elevation	6.0 to 5.5	-1.6 to -2.1	-9.1 to -9.6
Date	04/05/02	04/05/02	04/05/02
As	789	64.3	7.51
Pb	675	35.2	5.9
Other PP-Metals	<SCC	<SCC	NA
Naphthalene	113	7.32	NA
B(a)A	9.99	3.29	NA
B(b)F	4.64	1.99	NA
B(k)F	5.76	1.84	NA
B(a)P	6.06	2.13	NA
I(1,2,3-cd)P	2.74	1.04	NA
D(a,h)A	1.13	0.43	NA
Other SVOCs	<SCC	<SCC	NA
Benzene	0.597	ND	NA
Other VOCs	NA	NA	NA

SB21

Depth	11-11.5
Elevation	-2.7 to -3.2
Date	04/25/02
As	273
Pb	NA

SB-22

Depth	6.8-7.3	15.9-16.4
Elevation	6.0-5.5	-3.1 to -3.6
Date	04/03/02	04/03/02
As	1280	106
Pb	13000	55.5
Fluoranthene	125	NA
Other SVOCs	<SCC	NA

SB-23

Depth	4.4-4.9	14.4-14.9
Elevation	8.4-7.9	-1.6 to -2.1
Date	04/03/02	04/03/02
As	NA	11.1
B(a)P	0.734	ND
Other SVOCs	<SCC	<SCC

SB-24

Depth	6.1-6.6	14.4-14.9	23.6-24.1
Elevation	8.4 to 7.9	0.1 to -0.4	-9.1 to -9.6
Date	04/03/02	04/03/02	04/03/02
As	5.22	200	NA
Pb	121	1980	NA
Tl	ND	0.989	NA
SVOCs	NA	<SCC	NA
Benzene	NA	ND	NA
Other VOCs	NA	NA	NA

SB-25

Depth	1.2-1.7	3.2-3.7
Elevation	11 to 10.5	9.0 to 8.5
Date	04/06/02	04/06/02
As	4.85	9.94
Pb	91	71.5
Hg	0.184	NA
Se	ND	NA

SB-26

Depth	1.6-2.1	11.1-11.6
Elevation		1.5 to 1.0
Date	04/04/02	04/04/02
As	5.91	27.1
Pb	104	170
Cu	70.9	776
Zn	NA	ND
Other PP-Metals	<SCC	<SCC
B(a)A	12.4	3.70
Chrysene	12.6	4.42
B(b)F	11.7	2.80
B(k)F	8.87	2.64
B(a)P	13.2	3.55
I(1,2,3-cd)p	7.66	1.76
D(a,h)A	2.84	0.70
Benzene	NA	ND
Other VOCs	NA	NA

SB-27

Depth	2.4-2.9	4.4-4.9	14.4-14.9
Elevation	11.2 to 10.7	9.2 to 8.7	-0.8 to -1.3
Date	04/06/02	04/06/02	04/06/02
As	5.46	6.08	173
Pb	54.6	61.9	NA
Other PP-Metals	<SCC	NA	NA
B(a)A	2.38	NA	ND
B(b)F	2.17	NA	ND
B(k)F	2.37	NA	ND
B(a)P	2.69	NA	ND
I(1,2,3-cd)P	1.83	NA	ND
Other SVOCs	<SCC	NA	ND
Benzene	ND	NA	NA
Other VOCs	<SCC	NA	NA
Pesticides	<SCC	NA	NA
PCBs	<SCC	NA	NA
Cyanide	ND	NA	NA

SB-28

Depth	8.0-8.5
Elevation	8.1-7.6
Date	04/23/02
As	599
Pb	1290

SB-29

Depth	1.5-2	12.5-13
Elevation	14.7 to 14.2	3.7 to 3.2
Date	04/10/02	04/10/02
As	NA	113
Pb	NA	738
SVOCs	<SCC	NA

SB-30

Depth	3.0-3.5	8.1-8.6
Elevation	13.2 to 12.7	8.1 to 7.6
Date	04/10/02	04/10/02
As	NA	15.0
Pb	NA	19.7
B(a)A	0.53	7.05
B(b)F	0.54	5.55
B(k)F	0.45	4.41
B(a)P	0.63	5.68
I(1,2,3-cd)P	0.308	2.31
D(a,h)A	0.13	0.89
Other SVOCs	<SCC	<SCC

SB-31

Depth	11.6-12.1
Elevation	5.3 to 4.8
Date	04/06/02
As	6.19
Tl	0.248

SB-32

Depth	3.0-3.5	9.5-10	13.5-14
Elevation	11.8-11.3	5.3 to 4.8	1.3-0.8
Date	04/10/02	04/10/02	04/10/02
As	NA	735	ND
Pb	NA	276	ND
Tl	NA	2.52	NA
SVOCs	<SCC	NA	NA

SB33

Depth	13-13.5	20-20.5
Elevation	4.4 to 3.9	-2.6 to -3.1
Date	04/11/02	04/11/02
As	1550	9.14
Pb	6750	9.07

SB34

Depth	10.3-10.8	17.5-18
Elevation	0.5 to 0.0	-6.7 to -7.2
Date	04/11/02	04/11/02
As	1620	8.42
Pb	844	13

SB35

Depth	11-11.5	16-16.5
Elevation	0.5 to 0.0	-4.5 to 5.0
Date	04/11/02	04/11/02
As	3.21	3.83
Pb	7.78	18.4

SB36

Depth	3.5-4	6.6-7.1	12.6-13.1
Elevation	8.6 to 8.1	5.5 to 5.0	-0.5 to -1.0
Date	4/12/02	04/12/02	04/12/02
As	48.4	1610	3700
Pb	343	4060	20.1
B(a)A	12.2	NA	NA
Chrysene	13.2	NA	NA
B(b)F	14.3	NA	NA
B(k)F	10.6	NA	NA
B(a)P	12.8	NA	NA
I(1,2,3-cd)P	7.87	NA	NA
D(a,h)A	3.09	NA	NA
Other PAHs	<SCC	NA	NA

SB37

Depth	6.6-7.1
Elevation	5.5-5.0
Date	04/23/02
As	258
Pb	1350

SB38

Depth	9.9-10.4
Elevation	0.5-0.0
Date	04/25/02
As	102
Pb	4500

EXPLANATION

- PROPERTY BOUNDARY
- MW-3 — MONITORING WELL
- C-6 — SOIL BORING
- C3-9 — EWMA TEST PIT
- SB1 — DRAI SOIL BORING
- TP-1 — DRAI TEST PIT
- SB33 — PROPOSED SOIL BORING
- ARSENIC CONCENTRATIONS GREATER THAN 1000 ppm
- LEAD CONCENTRATIONS GREATER THAN 10,000 ppm

0 — 30 FT.
APPROXIMATE SCALE

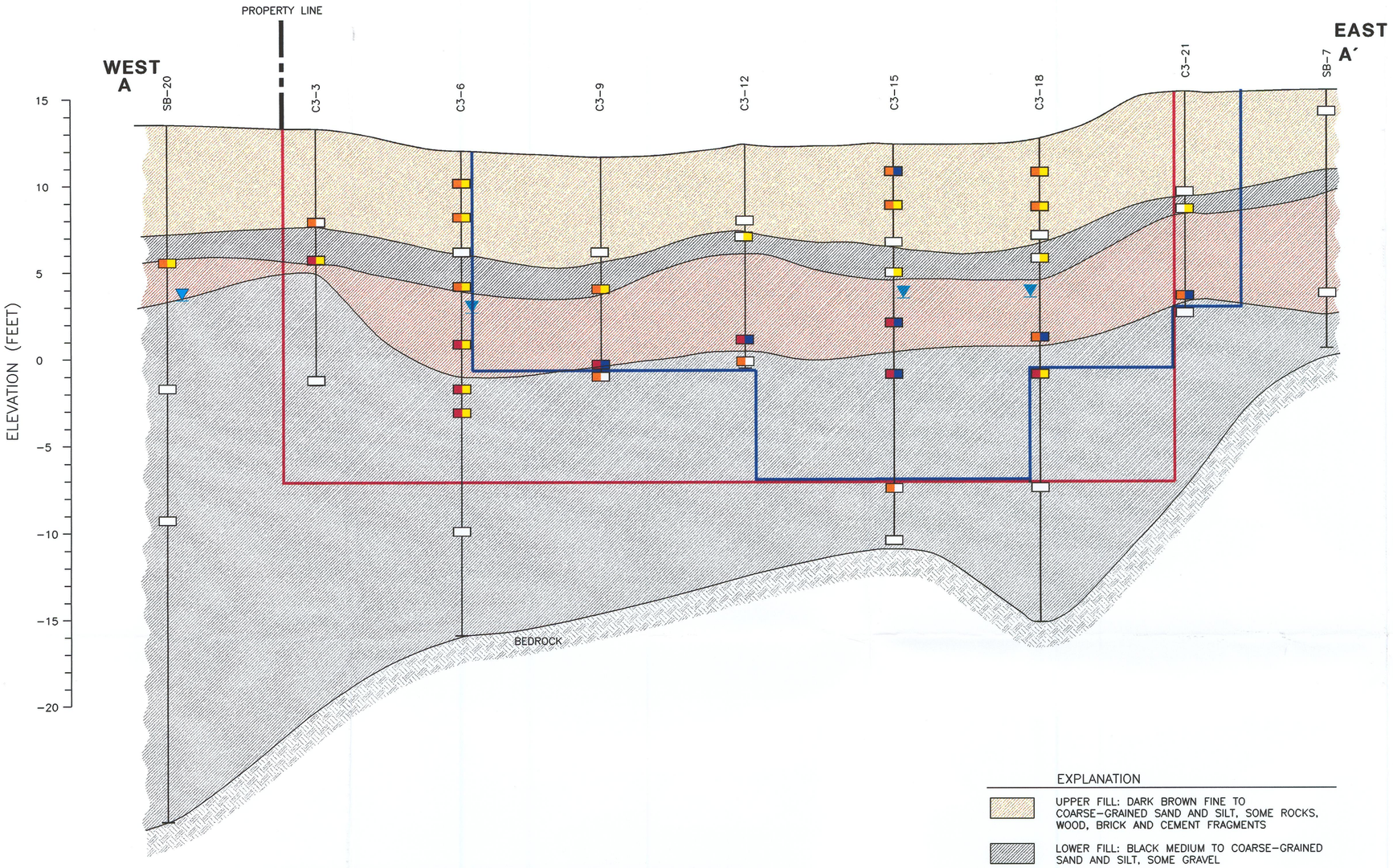
Dan Raviv Associates, Inc.
57 E. Willow Street Millburn, NJ 07041

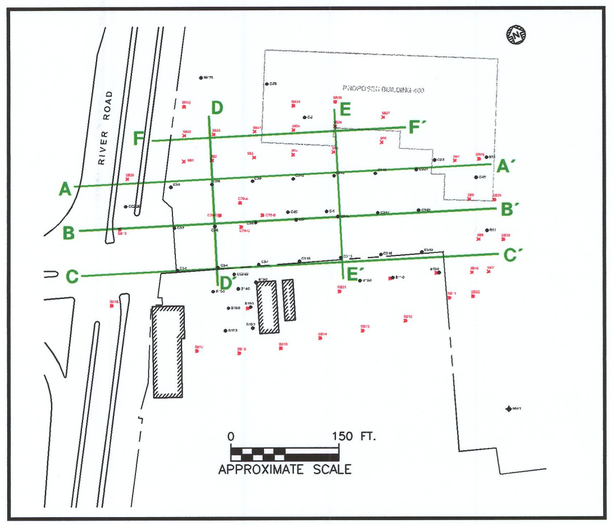
SOIL ANALYTICAL RESULTS
ARSENIC AREA

Former Celotex Industrial Park - Edgewater, NJ

PREPARED BY: KG/LB	DATE: APRIL 2002
JOB NO.: 01C2084	FIGURE: 2

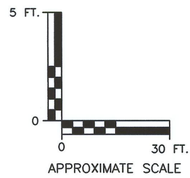
2084-9 -04/26/02





EXPLANATION

- UPPER FILL: DARK BROWN FINE TO COARSE–GRAINED SAND AND SILT, SOME ROCKS, WOOD, BRICK AND CEMENT FRAGMENTS
- LOWER FILL: BLACK MEDIUM TO COARSE–GRAINED SAND AND SILT, SOME GRAVEL
- LOWER FILL: REDDISH PURPLE FINE TO COARSE–GRAINED SAND
- NATIVE: GRAY SILT RED–BROWN SAND WITH TRACE MEADOW MAT
- WATER LEVEL
- ARSENIC <100 ppm
- ARSENIC >100 ppm AND <1,000 ppm
- ARSENIC >1,000 ppm
- LEAD <600 ppm, ON–SITE; <400 ppm, OFF–SITE
- LEAD >600 ppm AND <10,000 ppm, ON–SITE; >400 ppm AND <10,000 ppm, OFF–SITE
- LEAD >10,000 ppm
- VERTICAL EXTENT OF ARSENIC ABOVE 1,000 ppm
- VERTICAL EXTENT OF LEAD ABOVE 10,000 ppm



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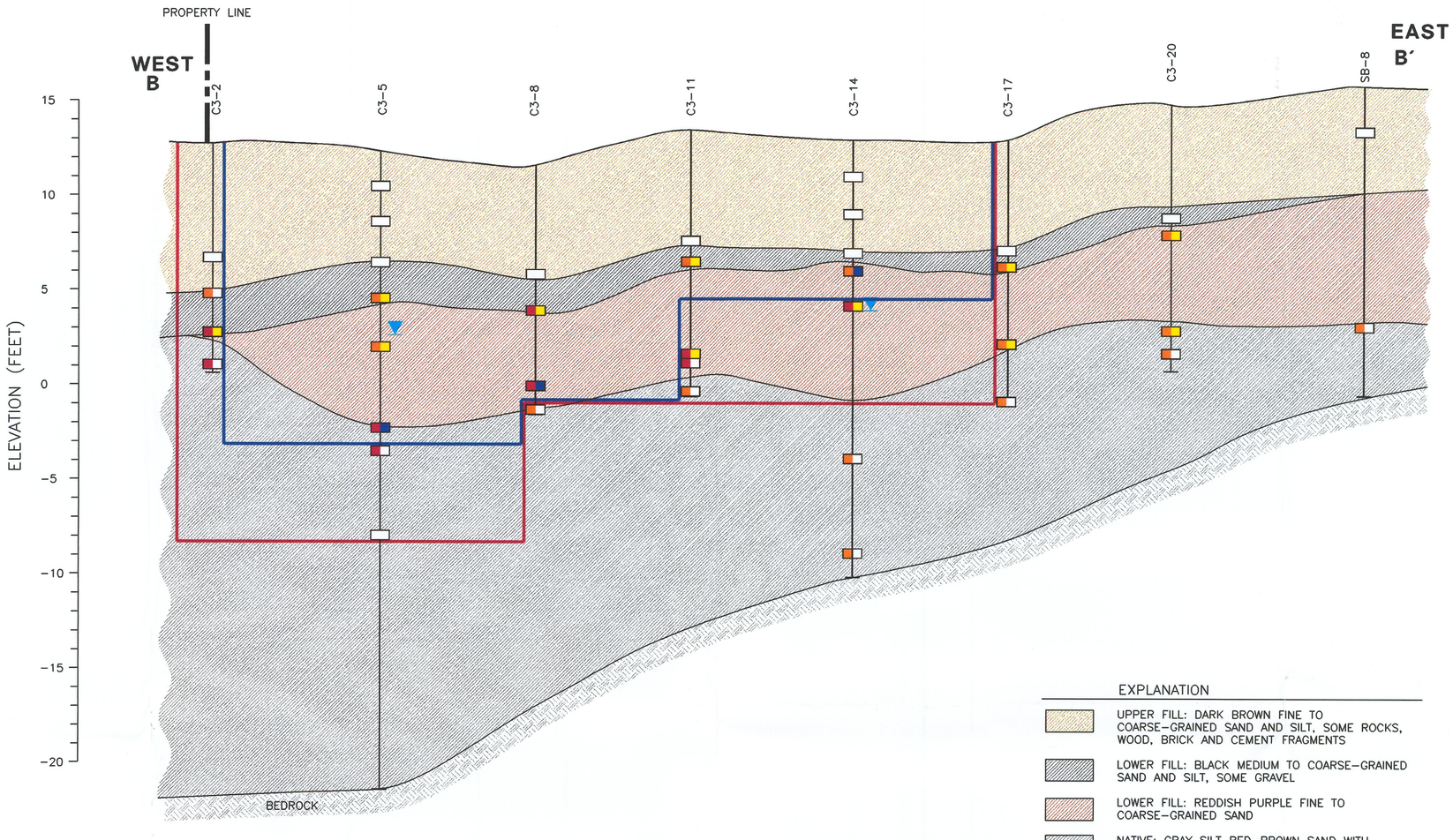
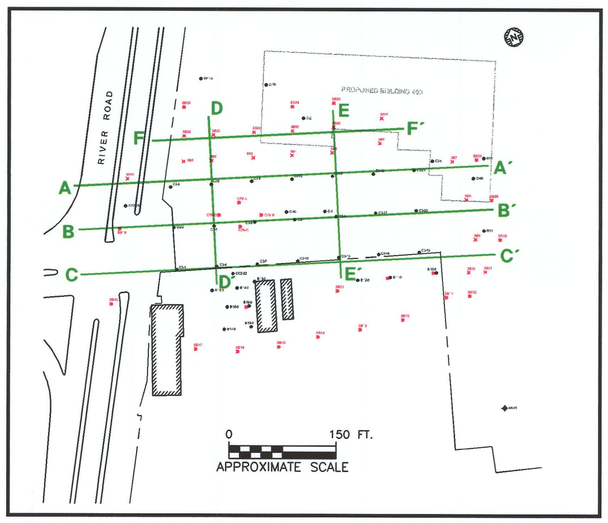
CROSS–SECTION THROUGH ARSENIC AREA
A–A'

FORMER CELOTEX INDUSTRIAL SITE – EDGEWATER, NJ

PREPARED BY: RKH/ODL	DATE: APRIL 2002
JOB NO.: 01C2084	FIGURE: 3





EXPLANATION

- UPPER FILL: DARK BROWN FINE TO COARSE-GRAINED SAND AND SILT, SOME ROCKS, WOOD, BRICK AND CEMENT FRAGMENTS
- LOWER FILL: BLACK MEDIUM TO COARSE-GRAINED SAND AND SILT, SOME GRAVEL
- LOWER FILL: REDDISH PURPLE FINE TO COARSE-GRAINED SAND
- NATIVE: GRAY SILT RED-BROWN SAND WITH TRACE MEADOW MAT
- WATER LEVEL
- ARSENIC <100 ppm
- ARSENIC >100 ppm AND <1,000 ppm
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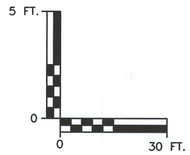
- LEAD >600 ppm AND <10,000 ppm, ON-SITE; >400 ppm AND <10,000 ppm, OFF-SITE
- LEAD >10,000 ppm
- VERTICAL EXTENT OF ARSENIC ABOVE 1,000 ppm
- VERTICAL EXTENT OF LEAD ABOVE 10,000 ppm

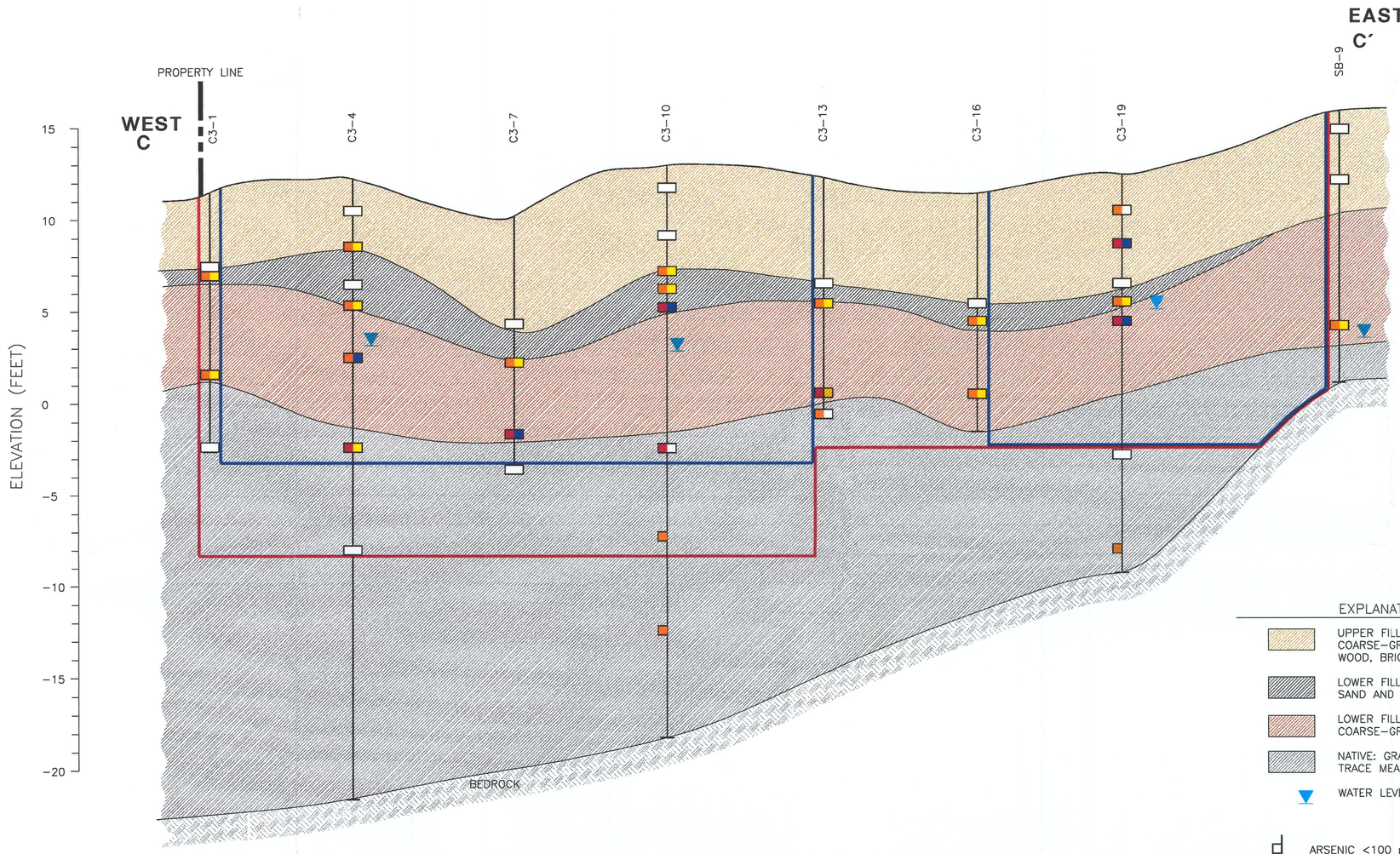


Dan Raviv Associates, Inc.
57 E. Willow Street Millburn, NJ 07041

CROSS-SECTION THROUGH ARSENIC AREA
B-B'

FORMER CELOTEX INDUSTRIAL SITE – EDGEWATER, NJ

PREPARED BY: RKH/ODL	DATE: APRIL 2002
JOB NO.: 01C2084	FIGURE: 4



EXPLANATION

- UPPER FILL: DARK BROWN FINE TO COARSE-GRAINED SAND AND SILT, SOME ROCKS, WOOD, BRICK AND CEMENT FRAGMENTS
- LOWER FILL: BLACK MEDIUM TO COARSE-GRAINED SAND AND SILT, SOME GRAVEL
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- ARSENIC >1,000 ppm
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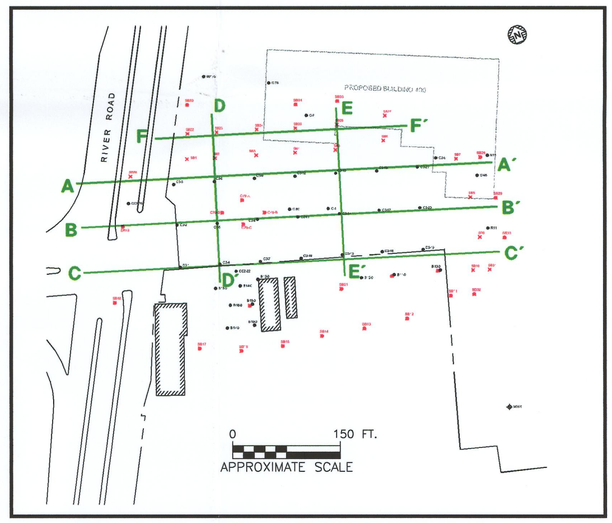
- LEAD >10,000 ppm
- VERTICAL EXTENT OF ARSENIC ABOVE 1,000 ppm
- VERTICAL EXTENT OF LEAD ABOVE 10,000 ppm



5 FT.
0
0
30 FT.
APPROXIMATE SCALE

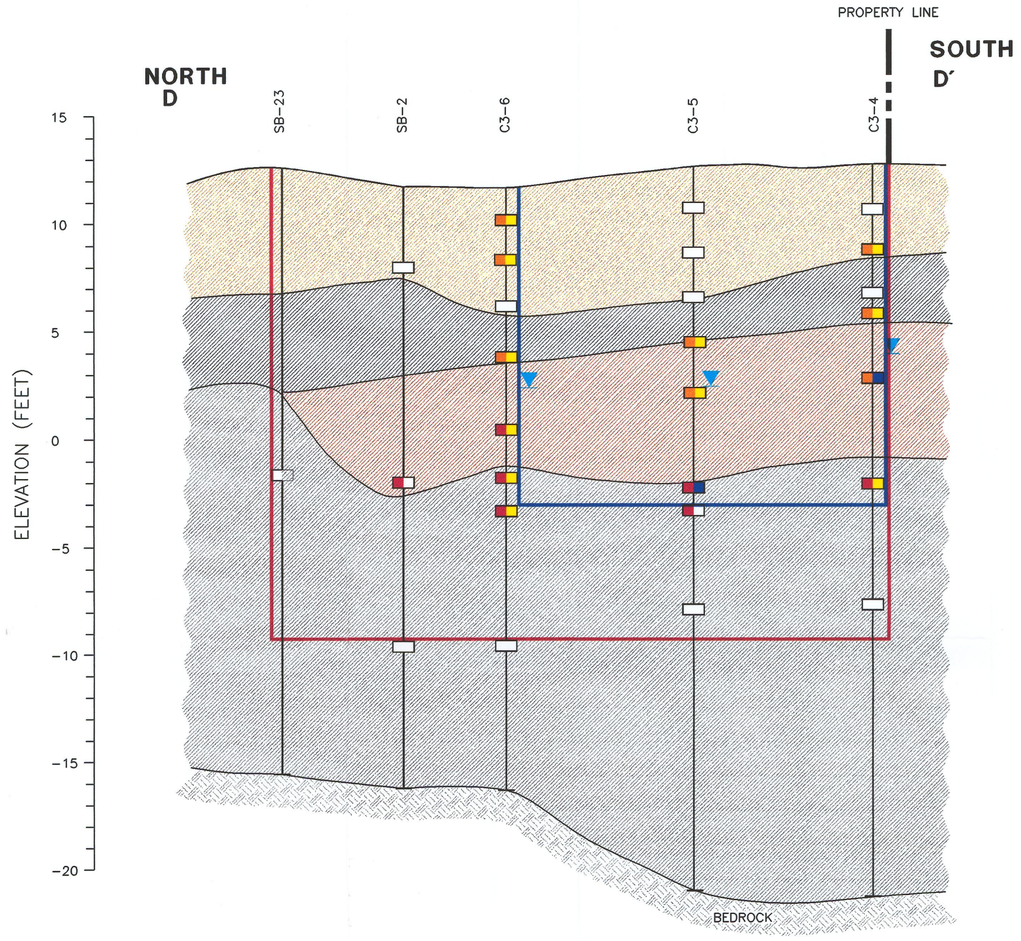
Dan Raviv Associates, Inc.
57 E. Willow Street Millburn, NJ 07041

CROSS-SECTION THROUGH ARSENIC AREA
C-C' AND F-F'

FORMER CELOTEX INDUSTRIAL SITE – EDGEWATER, NJ

PREPARED BY: RKH/ODL	DATE: APRIL 2002
JOB NO.: 01C2084	FIGURE: 5

2084-6C -04/30/02



EXPLANATION

- UPPER FILL: DARK BROWN FINE TO COARSE-GRAINED SAND AND SILT, SOME ROCKS, WOOD, BRICK AND CEMENT FRAGMENTS
- LOWER FILL: BLACK MEDIUM TO COARSE-GRAINED SAND AND SILT, SOME GRAVEL
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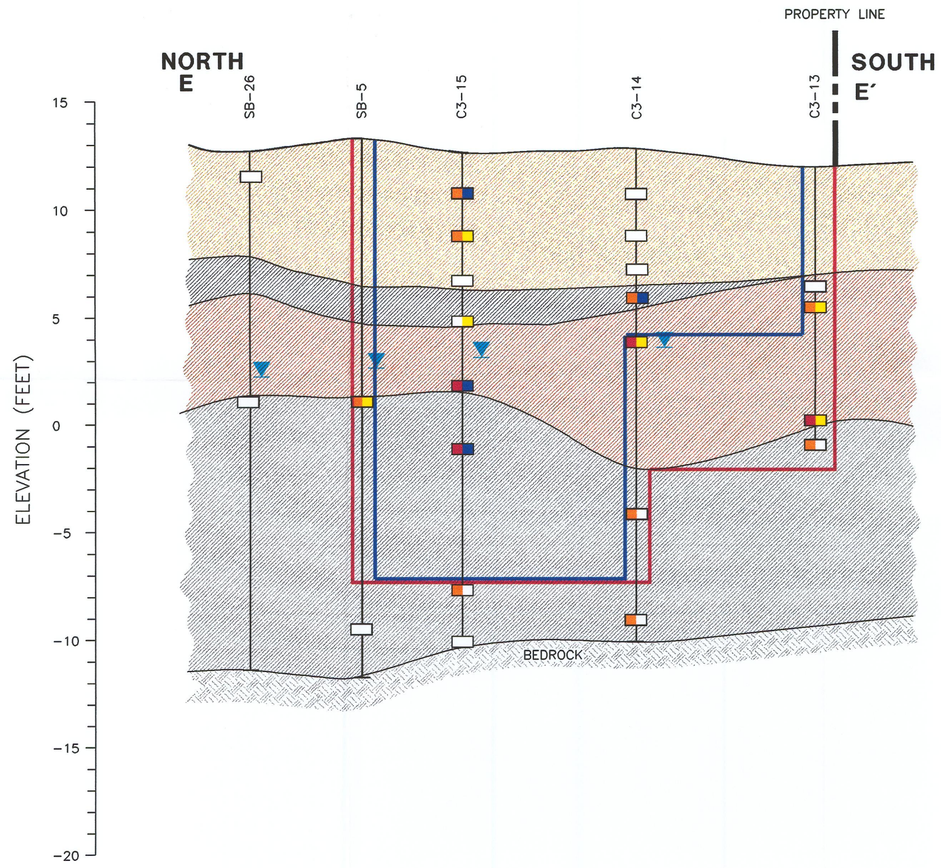
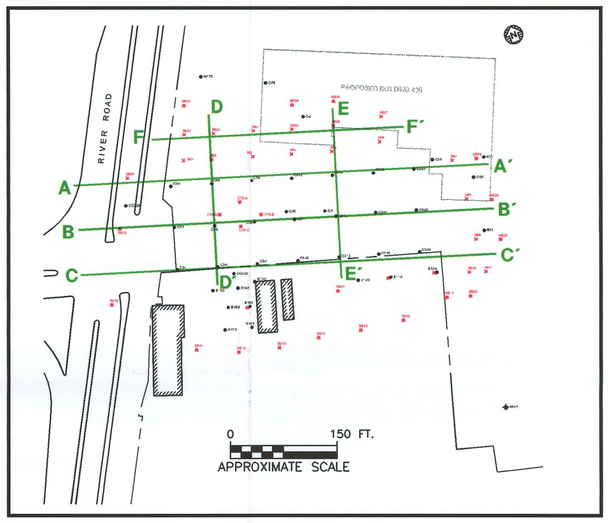
- LEAD >600 ppm AND <10,000 ppm, ON-SITE; >400 ppm AND <10,000 ppm, OFF-SITE
- LEAD >10,000 ppm
- VERTICAL EXTENT OF ARSENIC ABOVE 1,000 ppm
- VERTICAL EXTENT OF LEAD ABOVE 10,000 ppm





5 FT.
0
0 30 FT.
APPROXIMATE SCALE

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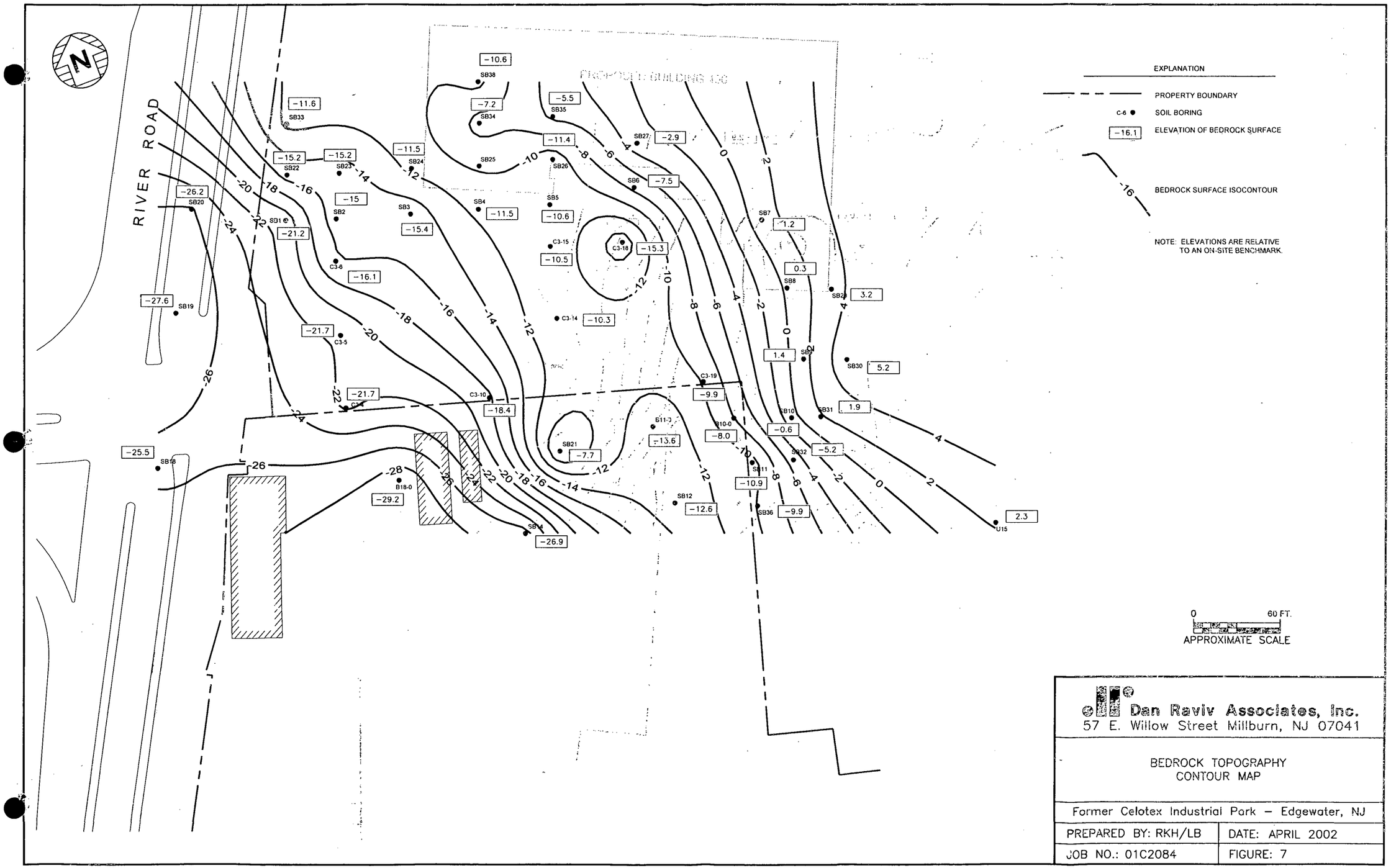
CROSS-SECTION THROUGH ARSENIC AREA
D-D' AND E-E'

FORMER CELOTEX INDUSTRIAL SITE – EDGEWATER, NJ

PREPARED BY: RKH/ODL	DATE: APRIL 2002
JOB NO.: 01C2084	FIGURE: 6

2084-6D -04/30/02



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BEDROCK TOPOGRAPHY
CONTOUR MAP

Former Celotex Industrial Park – Edgewater, NJ

PREPARED BY: RKH/LB	DATE: APRIL 2002
JOB NO.: 01C2084	FIGURE: 7

2084-8 -04/30/02

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RIVER ROAD

MW-22

DMW-1 (Deep Alluvium)

AREA TO BE EXCAVATED AND CONSOLIDATED UNDER CAP (ALTERNATIVES 1 AND 2) OR REMOVED (ALTERNATIVES 3 AND 4)*

PROPOSED BUILDING 400

MW-4 (Abandoned)

REMEDIATION AREA

MW-6 (Abandoned)

Old MW (Abandoned)

SB28 99175 SB33 SB22 SB23 SB1 SB2 SB3 SB4 SB5 SB6 SB24 SB25 TP-1 SB26 SB27 SB35 SB34 SB38 C-78 C-2

C2-7 PEC4-5 PEC4-2 PEC4-1 PEC4-3 PEC4-4 C2-5 SB7 N11 N13 C3-21 C-95 SB8 SB29

C3-3 C3-6 C3-9 C3-12 C3-15 C3-18 C79-A PEC79-5 C79-D C2-2 PEC79-1 C79-B PEC79-4 PEC79-3 PEC79-2 C3-8 C3-5 C79-C C-80 C-1 C3-14 C3-11 C3-17 C3-20 C3-2

R11 C-6 R13 SB9 SB30

C3-1 C3-4 C3-7 C3-10 C3-13 C3-16 C3-19 CC2-22 B13-0 B14-0 B15-0 B18-0 B16-0 B19-0 B17-0 B12-0 B11-0 B10-0 SB21 SB10 SB31 SB11 SB32 SB12 SB36 SB13 SB14 SB37 SB17 SB16 SB15

EXPLANATION

	PROPERTY BOUNDARY
MW-3	MONITORING WELL
C-6	SOIL BORING
C3-9	EWMA TEST PIT
SB1	DRAI SOIL BORING
TP-1	DRAI TEST PIT
SB33	PROPOSED SOIL BORING

* AREA SHOWN BASED ON 1 SAMPLE AT BORING SB34. AREA MAY BE REDUCED WITH ADDITIONAL DELINEATION

N

0 40 FT.

APPROXIMATE SCALE

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REMEDIATION AREA

Former Celotex Industrial Park – Edgewater, NJ

PREPARED BY: PG/LB	DATE: APRIL 2002
JOB NO.: 01C2084	FIGURE: 8

2084–10 –05/01/02

304812

TABLES

Table I
Evaluation of Remedial Alternatives
Summary of Compliance with NJDEP Remedial Action Selection Factors
Arsenic Area, Former Celotex Industrial Park, Edgewater, New Jersey

REMEDIAL ALTERNATIVE	REMEDIATION APPROACH	REMEDIAL ACTION	REMEDIAL ACTION SELECTION FACTORS (1)							
			Protect Public Health and Safety and Environment				Implementability	Consistent with Laws/Regs.	Negative Impact on Local Community	Potential for Adverse Environmental Conditions
			Technical performance, effectiveness and reliability	Reduce mobility or volume	Minimize short-term risk and impacts	Mitigate or eliminate off-site migration				
1	Containment and Exposure Control	Soil: Cap and Deed Notice GW: CEA	Yes	Yes	Yes	Yes	Yes	Yes	No	No
2	Containment and Exposure Control	Soil: Cap and Deed Notice GW: Slurry wall with pump and treat, CEA for areas outside of slurry wall	Yes	Yes	**No**	Yes	Yes	Yes	**Yes**	No
3	Combination of Containment and Exposure Control and Active Treatment	Soil: Excavation of Shallow soils, Cap and Deed Notice for deeper soils GW: Slurry wall with pump and treat,CEA for areas outside of slurry wall	Yes	Yes	**No**	Yes	**No**	Yes	**Yes**	**Yes**
4	Active Treatment	Soil: Excavation of soils to bedrock GW: CEA for areas outside of excavated zone	Yes	Yes	**No**	Yes	**No**	Yes	**Yes**	**Yes**

Definitions:
GW Ground water.
CEA Classification Exception Area.

Notes:
(1) Remedial Action Selection Factors from "Technical Requirement for Site Remediation" at N.J.A.C. 7:26E-5.1(c)1 to 5.

Table II
Cost Comparison for Remedial Alternatives
Former Celotex Industrial Park
Edgewater, NJ

Cost Elements	Remedial Alternative No.			
	1	2	3	4
	Soil: Cap and Deed Notice GW: CEA	Soil: Cap and Deed Notice GW: Slurry Wall with Pump & Treat; CEA	Soil: Excavate to Water Table and Deed Notice GW: Slurry Wall with Pump & Treat; CEA	Soil: Excavate to Bedrock GW: CEA
CAPITAL COSTS:				
Construction Activities				
Mobilization/Demobilization	$23,567	$63,172	$126,016	$276,497
Site Work/ Preparation	$7,252	$16,034	$16,034	$25,215
Additional Ground Water Investigation	$140,000	$89,060	$89,060	N/A
Hot Spot Soil Excavation (Footprint of 400 Building Only)	$215,172	$215,172	$337,978	$337,978
Soil Excavation to Water Table	N/A	N/A	$1,488,589	N/A
Soil Excavation to Bedrock	N/A	N/A	N/A	$6,708,338
Ground Water Containment and Extraction System	N/A	$848,700	$848,700	N/A
Ground Water Treatment System	N/A	$210,500	$210,500	N/A
Asphalt Cap and Roadways	$240,324	$240,324	$240,324	N/A
Contingency (20% scope and 15% bid)	$219,210	$589,036	$1,175,020	$2,571,810
Professional/Technical Services	$220,000	$432,000	$861,000	$1,885,000
Institutional Controls	$20,000	$20,000	$20,000	$10,000
TOTAL CAPITAL COSTS:	**$1,100,000**	**$2,700,000**	**$5,400,000**	**$11,800,000**
OPERATION & MAINTENANCE COSTS (PRESENT VALUE):	**$1,000,000**	**$3,800,000**	**$3,700,000**	**$500,000**
TOTAL PROJECT COST (PRESENT VALUE):	**$2,100,000**	**$6,500,000**	**$9,100,000**	**$12,300,000**

GW = Ground Water
CEA = Classification Exception Area
N/A = Not Applicable

NOTES:
(1) All Costs are in Year 2002 Dollars.
(2) USEPA Recommended Discount Rate of 3.9% was used for Present Value Calculations
(3) The information in this cost estimate summary table is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative and/or NJDEP comments on the proposed remedial action work plan.
(4) Alternative No. 4 could cost significantly more than shown based on current uncertainties regarding excavation production rates with depth; potential need for tie-backs or bracing during excavation to bedrock; increased dewatering and treatment needs; and other factors.